

TABLE 5

SECTION III

## **SECTION III**

# **STATEMENT OF OPINIONS**

# **HALLIWELL**

ENGINEERING ASSOCIATES INCORPORATED

## **STATEMENT OF OPINIONS**

### **BROOKHOLLOW I**

In preparing this report, we have formulated certain opinions pertaining to the costs for the removal and replacement of the asbestos containing fireproofing. Those opinions relate specifically to costs incurred to date.

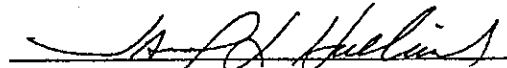
For the purposes of the opinions set forth herein, we have:

- (1) collected and reviewed certain information relating to the original design and construction of the building;
- (2) discussed with building management, issues pertaining to the building's construction and operations as well as the removal and replacement of the asbestos containing fireproofing;
- (3) inspected and photographed the building on two independent occasions;
- (4) collected and reviewed cost information pertaining to the removal and replacement of the asbestos containing fireproofing;
- (5) collected and reviewed project information pertaining to the removal and replacement of the asbestos containing fireproofing;
- (6) evaluated past costs pertaining to the asbestos abatement contractors, asbestos consultants and miscellaneous costs related to the removal and replacement of the asbestos containing materials;
- (7) determined gross costs for the asbestos abatement;
- (8) determined the net project costs directly related to the abatement of the asbestos fireproofing;
- (9) determined the abatement project areas and calculated the net costs per square foot for the abatement of the asbestos fireproofing; and compared them to the project size, the amount of asbestos fireproofing being abated, the scope of the work, the level of difficulty, the method of contractor selection, the location of the project and the timeframe in which the work occurred;

- (10) compared the net costs for the abatement of the asbestos containing fireproofing with those of certain other comparable projects;
- (11) performed such other analyses as we have deemed appropriate.

Based upon and subject to the foregoing, we are of the opinion that the asbestos abatement actions taken by The Prudential Insurance Company of America, in the Brookhollow I building, were both reasonable and appropriate; and

Based upon and subject to the foregoing, we are of the opinion on the date hereof, that the total net project costs as calculated in this report, were incurred due to the past abatement of asbestos containing fireproofing in this building, and that those costs are both fair and reasonable.

  
Jack L. Halliwell, P.E.  
*President*  
Halliwell Engineering Associates, Inc.

July, 1996

APPENDIX A

## **APPENDIX A**

**PART A: ASBESTOS ABATEMENT PROJECT INFORMATION**

**PART B: BUILDING INSPECTIONS CONDUCTED BY  
HALLIWELL ENGINEERING ASSOCIATES**

**PART C: LOCATION AND DETAILS OF INFORMATION  
CONSIDERED IN THE DEVELOPMENT OF THIS  
REPORT**

**PART A: ASBESTOS ABATEMENT PROJECT INFORMATION:**

1. Total floor area abated by Prudential: 202,049 sq. ft.
2. Floors abated by Prudential: Ground through 11th and three mechanical penthouses (two elevator machine rooms and a fan room)
3. Dates of Prudential's abatement: 1/86 to 7/86
4. Floors with asbestos fireproofing remaining: All floors abated
5. Total floor area with fireproofing remaining as of July 1996: All floors have been abated. Small inaccessible amounts may remain throughout the structure.
6. Asbestos abatement scope of work:
  - a. Fireproofing locations: Beams only
  - b. Fireproofing surface area to floor area ratio:  $15,033.14 \div 17,728 = 0.85$
  - c. Location of inaccessible fireproofing left in place: All floors have been abated. Small inaccessible amounts may remain throughout the structure.
  - d. Base building components:
    - HVAC duct mains: Ducts were removed, covered, and stored by the abatement contractor and reinstalled under separate contract, costs not included in this report
    - Duct insulation: Small amounts of duct insulation were replaced
    - Sprinklers: Building was not, and is not, sprinklered
    - Electrical main feeds: Left in place
    - Column enclosures: The column enclosures were demolished. Overspray removed from columns and columns resprayed under the abatement contractor's contract. New enclosures were installed under separate contract, costs not included in this report.



- e. Core Area: Tops of the sheetrock demising walls were demolished, the beams were abated and resprayed. The cinder block walls left in place.
- Mechanical room: Fireproofing removed and resprayed
  - Telephone/electric closet: No telephone/electric closets; telephone and electrical equipment are located in mechanical room
  - Bathrooms: Fireproofing removed and resprayed
  - Stairwells: There was no fireproofing identified in the stairwells. Stairwells have drywall ceilings.
- f. Other ACM:
- VAT: VAT was not referenced in the asbestos abatement cost or project information documents
  - TSI: TSI was not referenced in the asbestos abatement cost or project information documents
  - Miscellaneous: No other ACM was mentioned in the asbestos abatement cost or project information documents
- g. Special Conditions:
- Lobby: Plaster ceiling was scaffolded, shored, and fireproofing removed from above the ceiling
  - Carpet and Drapes: Disposed as asbestos waste in Phase I. Hepa vacuumed and disposed as construction debris in Phase II.
  - The lights located in large bay areas were cleaned and wrapped in place. In other areas they were disconnected, cleaned, and stored.

**PART B: BUILDING INSPECTIONS CONDUCTED BY HALLIWELL ENGINEERING ASSOCIATES**

**1. Initial Inspection:**

Date/Inspectors: 4/26/96; Gary Halliwell, Project Manager and Paul Keitz, Project Manager

Building contact person: Dean Holcomb, Property Manager

Inspection guide: Tom Moore, Building Engineer

Unabated floors inspected: All floors were abated

Abated floors inspected: 6th, 9th, 11th and penthouse (elevator machine room)

Photographic record: 59 photos

**2. Second Inspection:**

Date/Inspectors: 6/4/96; Jack Halliwell, P.E. and Todd Cormier, P.E.

Building contact: Dean Holcomb, Property Manager

Inspection guide: Building staff

Unabated floors inspected: All floors were abated

Abated floors inspected: 9th, 11th, 10th, 1st, ground, penthouse (elevator machine room)

Photographic record: 50 photos

**PART C: LOCATION AND DETAILS OF INFORMATION CONSIDERED IN THE DEVELOPMENT OF THIS REPORT**

**1. Building Information: Located in HEA Box No. B.H.-1**

Building design drawings:	<u>Architectural, Structural, Mechanical and Electrical</u>
Asbestos survey:	<u>10/25/85; BCM Converse Inc.</u>
Correspondence:	<u>Miscellaneous</u>
Building inspections:	<u>4/26/96: Gary Halliwell, Project Manager and Paul Keitz, Project Manager</u> <u>6/4/96: Jack Halliwell, P.E. and Todd Cormier, P.E.</u>
Photographs and photo logs:	<u>From the inspections above</u>
Discussions with building personnel:	<u>Dean Holcomb, Property Manager</u>

**2. Asbestos Abatement Cost Information: Located in HEA Box B.H.-1**

- Consultant's proposal
- Contractor's bid form
- Contract documents
- Consultant's invoices
- Contractor's applications for payment
- Change orders
- Property management invoices
- Correspondence

**3. Asbestos Abatement Project Information: Located in HEA Box No. B.H.-1**

- Contract documents
- Abatement specifications
- Abatement meeting notes

Consultant's daily logs

Contractor's daily logs

Correspondence

Bulk/air sampling results

Federal and state asbestos regulations

APPENDIX B

## **APPENDIX B**

### **PROJECT FLOOR AREA/FIREPROOFING AREA CALCULATIONS**

Brookhollow I  
Houston, TX  
(W.R. Grace)

**TABLE 3**  
**Detailed Costs for Completed Asbestos Fireproofing Removal and Replacement Projects**

Floor No.	Vendor	Invoice No.	Invoice Date	Total Invoice	Non FP	Description
Grd - 6	W.T. Stephens	App #1	01/16/86	\$213,030.00		Asbestos Abatement. Original Contract Value = \$814,000.00 for asbestos abatement (Ground-6th).
Grd - 6	W.T. Stephens	App #2	02/03/86	213,196.50		Asbestos Abatement.
Grd - 6	W.T. Stephens	App #3	02/19/86	377,773.50		Asbestos Abatement.
Grd - 6	W.T. Stephens	App #4	03/03/86	60,000.00		Asbestos Abatement. (Includes C.O.#1 for \$50,000 to remove extra layer of carpet; replace drywall removed for access to remove fireproofing; provide tenant access and isolation; reduce re-fireproofing from 3 hour to 2 hour; accelerate schedule; removal and replacement of fireproofing behind brick soffit in the lobby; provide conditioned air to tenants on the 4th floor).
7-11th	W.T. Stephens	App #5	03/14/86	131,175.00		Asbestos Abatement (includes CO #2 for \$741,000.00 for asbestos removal flrs 7-11).
7-11th	W.T. Stephens	App #6	03/31/86	155,677.50		Asbestos Abatement.
7-11th	W.T. Stephens	App #7	04/15/86	228,172.50		Asbestos Abatement.
7-11th	W.T. Stephens	App #8	04/30/86	136,125.00		Asbestos Abatement.
7-11th	W.T. Stephens	App #9	05/15/86	37,250.00		Asbestos Abatement.
7-11th	W.T. Stephens	App #10	06/18/86	25,200.00		Asbestos Abatement.
7-11th	W.T. Stephens	App #11	06/30/86	10,200.00	x	Asbestos Abatement (includes CO #3: backcharge (\$20,000.00) misc. repairs caused by W.T. Stephens damage during abatement. CO #4: \$2,800.00 for furniture disposal).
						Misc. deduct = \$2,800.00
				<b>Contractor Subtotal = \$1,587,800.00</b>		<b>Total Contract Value = \$814,000.00 (P.O.) + \$773,800.00 (CO's) = \$1,587,800.00</b>
Grd - 6th	BCM Converse	1-105	01/31/86	\$32,560.00		Design and project management through 01/16/86.
Grd - 6th	BCM Converse	2-155	02/25/86	16,280.00		Design and project management through 01/31/86.
Grd - 6th	BCM Converse	3-282	03/28/86	16,280.00		Project management through 02/27/86.
7-11th	BCM Converse	4-489	04/30/86	72,660.00		Project management through 04/10/86.
7-11th	BCM Converse	9-996	09/09/86	39,744.00		Project management through 07/17/86.
				<b>Consultant Subtotal = \$177,524.00</b>		
Grd - 11th	Prop Mgt System	028784	05/30/86	\$20,000.00		Management fee for asbestos abatement.
				<b>Prop. Mgt. Subtotal = \$20,000.00</b>		
				<b>Gross Abatement Project Costs = \$1,785,324.00</b>	x	<b>Total Miscellaneous Deduct = \$2,800.00 (Deducted on Table 2).</b>

**BROOKHOLLOW I****FIREPROOFED FLOOR AREA CALCULATIONS**

Floor	Gross Area	Non-Fireproofed Floor Areas			Net Fireproofed Floor Area (All Abated by Pru)
		Elevator and Stairs	Open Area	Elev. #5	
Ground	8,064	608	1,155	N/A	6,301
1	18,336	608	N/A	N/A	17,728
2	18,336	608	N/A	N/A	17,728
3	18,336	608	N/A	N/A	17,728
4	18,336	608	N/A	N/A	17,728
5	18,336	608	N/A	N/A	17,728
6	18,336	608	N/A	N/A	17,728
7	18,336	608	N/A	N/A	17,728
8	18,336	608	N/A	N/A	17,728
9	18,336	608	N/A	80	17,648
10	18,336	608	48	80	17,600
11	18,336	608	N/A	80	17,648
Penthouse Elev. Mach. Room	704	N/A	N/A	N/A	704
Penthouse Elev. #5	90	N/A	N/A	N/A	90
Penthouse Fan Room	234	N/A	N/A	N/A	234
TOTAL					202,049

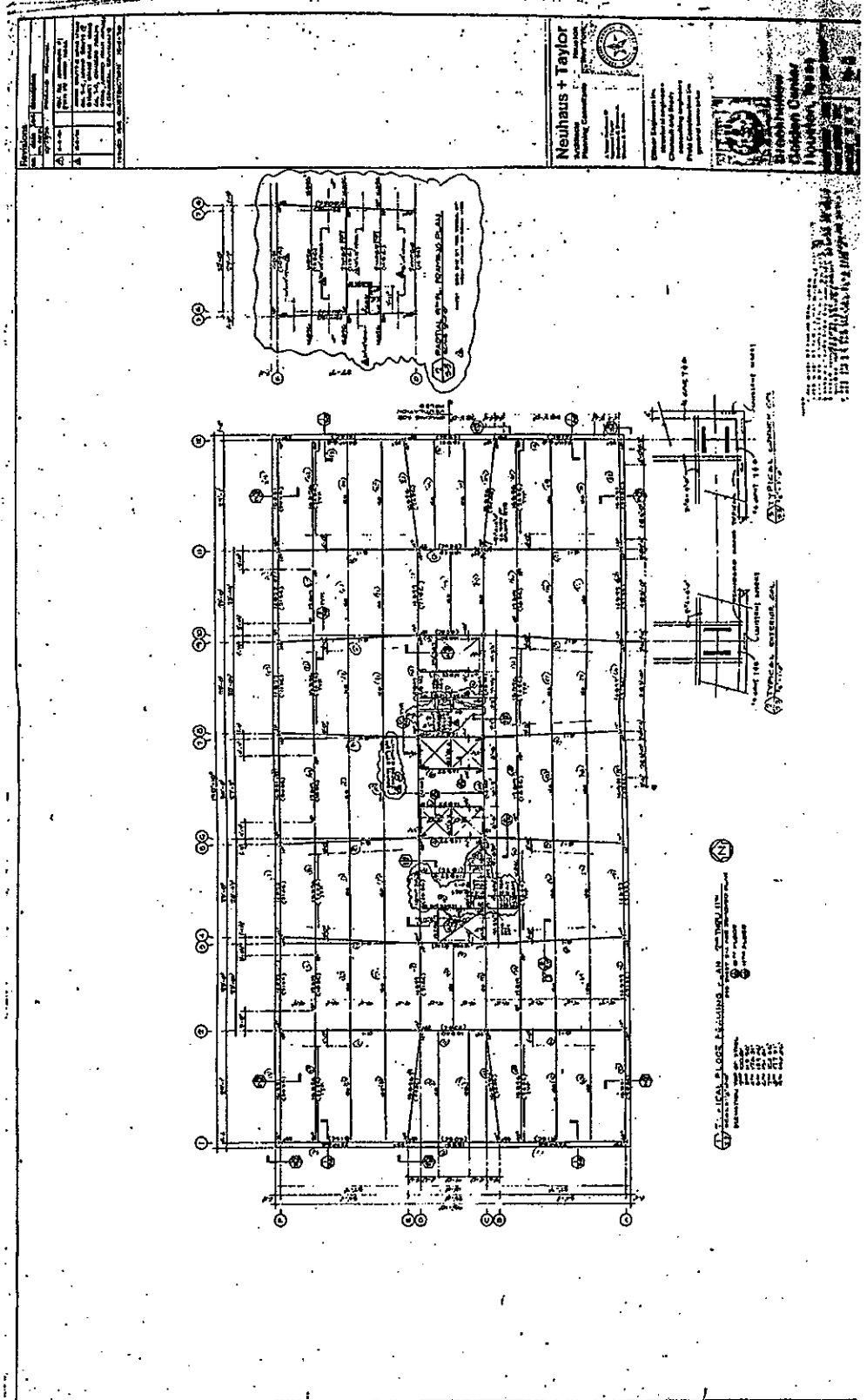
Typical Floor used for fireproofing ratio: 1st - 8th floors

Typical Floor area = 17,728 sq. ft.



# **FIREPROOFING SURFACE AREA CALCULATIONS (Typical Office Floor)**

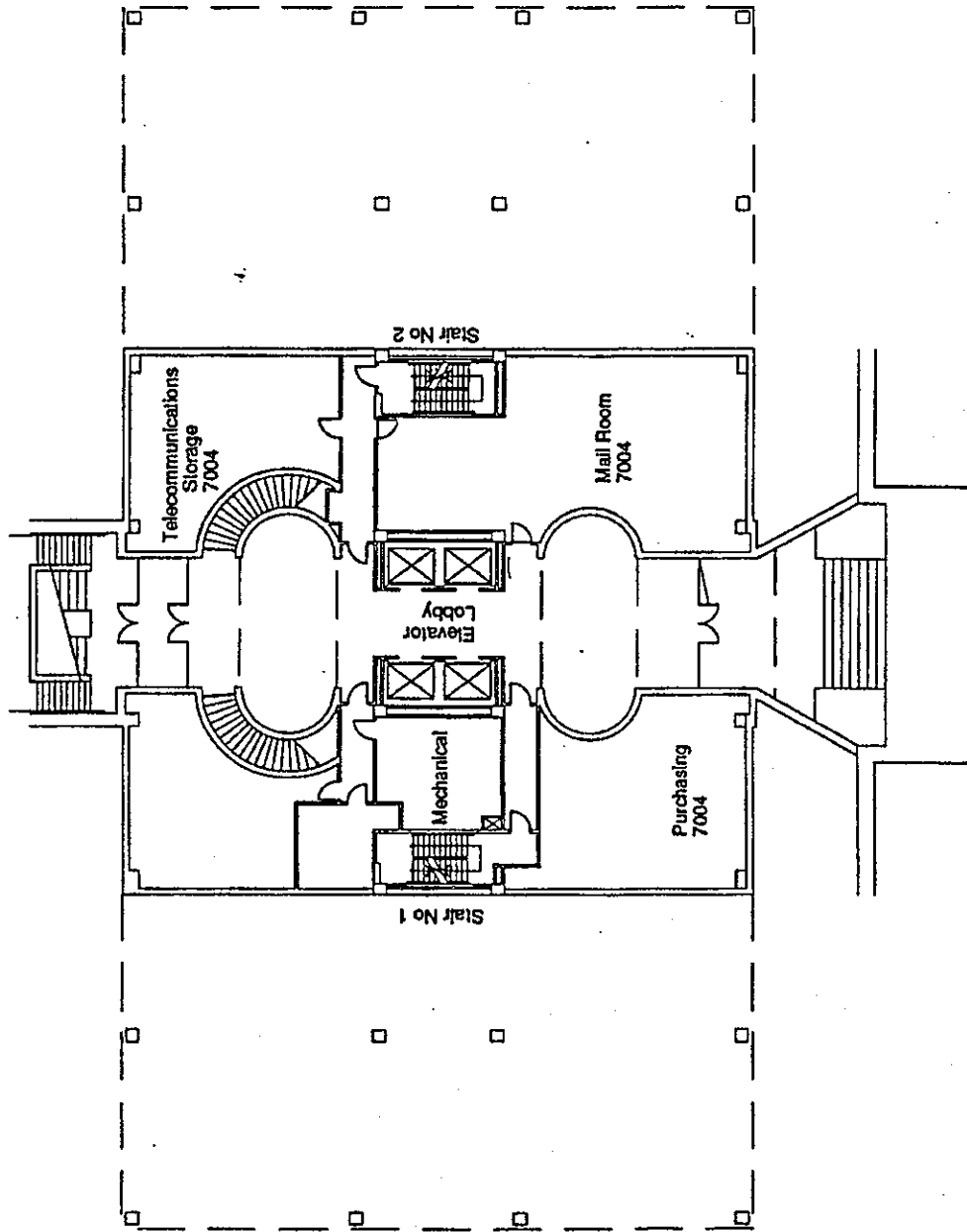
BUILDING: BROOKHOLLOW I Houston, TX (Beams only, no columns)									
Fireproofed Floor Area (Typical Floor): 17,728 square feet (sf)									
Typical Floor Location: 2nd thru 11th (Typical Framing Plan)									
BEAM NUMBER	BEAM SIZE	No. Beams	TOTAL BEAM LENGTH Feet (ft)	NET BEAM FIREPROOFED AREA (sq. ft.)	TOTAL BEAM FIREPROOFED AREA (sq. ft.)	AVERAGE (1) OVERSPRAY WIDTH (inches)	TOTAL OVERSPRAY AREA (length x width x 2 sides x 1.5 deck factor) (sq. ft.)	TOTAL BEAM & OVERSPRAY FIREPROOFING AREA (sq. ft.)	
1 - 4	24WF68	4 @	34.08 =	136.32	826.10	0.5	204.48	1,030.58	
5 - 6	16B31	2 @	25.00 =	50.00	196.00	0.5	75.00	271.00	
7 - 10	14WF48	4 @	37.58 =	150.32	625.33	0.5	225.48	850.81	
11 - 12	18B40	2 @	18.00 =	36.00	157.68	0.5	54.00	211.68	
13 - 16	14WF48	4 @	37.67 =	150.68	626.83	0.5	226.02	852.85	
17	14WF48	1 @	37.75 =	37.75	157.04	0.5	56.63	213.67	
18 - 19	14WF48	2 @	37.61 =	75.22	312.92	0.5	112.83	425.75	
20	14WF48	1 @	37.83 =	37.83	157.37	0.5	56.75	214.12	
21 - 22	16B26	2 @	18.00 =	36.00	132.84	0.5	54.00	186.84	
23 - 30	14B22	8 @	18.00 =	144.00	495.36	0.5	216.00	711.36	
31 - 34	16B31	4 @	29.08 =	116.32	455.97	0.5	174.48	630.45	
35 - 50	16B26	16 @	29.08 =	465.28	1,716.88	0.5	697.92	2,414.80	
51 - 52	16B26	2 @	29.29 =	58.58	216.16	0.5	87.87	304.03	
53 - 54	16B26	2 @	29.19 =	58.38	215.42	0.5	87.57	302.99	
55 - 62	14B22	4 @	25.00 =	100.00	344.00	0.5	150.00	494.00	
63 - 66	12B19	4 @	25.00 =	100.00	295.00	0.5	150.00	445.00	
67 - 70	12B19	4 @	24.33 =	97.32	287.09	0.5	145.98	433.07	
70 - 74	12B19	4 @	24.00 =	96.00	283.20	0.5	144.00	427.20	
75 - 77	12B22	3 @	25.04 =	75.12	223.11	0.5	112.68	335.79	
78 - 80	12B22	3 @	23.375 =	70.13	208.29	0.5	105.20	313.49	
81 - 84	16B26	4 @	26.00 =	104.00	383.76	0.5	156.00	539.76	
85 - 88	16B26	4 @	26.75 =	107.00	394.83	0.5	160.50	555.33	
89 - 92	16B26	4 @	27.67 =	110.68	408.41	0.5	166.02	574.43	
93 - 94	18WF50	2 @	28.375 =	56.75	270.13	0.5	85.13	355.26	
95 - 96	21B49	2 @	28.004 =	56.01	277.81	0.5	84.02	361.83	
97 - 98	16B31	2 @	30.00 =	60.00	235.20	0.5	90.00	325.20	
99 - 100	12B19	2 @	29.67 =	59.34	175.05	0.5	89.01	264.06	
101 - 102	12B19	2 @	28.83 =	57.66	170.10	0.5	86.49	256.59	
103 - 104	12B19	2 @	28.00 =	56.00	165.20	0.5	84.00	249.20	
105 - 106	30WF99	2 @	27.17 =	54.34	400.49	0.5	81.51	482.00	
<b>Beam and Overspray Totals</b>				<b>2,813.03</b>	<b>10,813.37</b>		<b>4,219.57</b>	<b>15,033.14</b>	
(1) 6' is the minimum fireproofing overspray amount observed in most buildings.									
COLUMN TOTALS				AVERAGE COLUMN SIZE	AVG. COLUMN FIREPROOFED AREA (sq. ft.)	COLUMN LENGTH Floor feet (ft)	NUMBER OF COLUMNS	TOTAL COLUMN FIREPROOFED AREA (sq. ft.)	
0				0	0	0	0	0.00	
<b>TOTAL FIREPROOFING SURFACE AREA (Typical Floor)</b>									<b>15,033.14</b>
<b>FIREPROOFING SURFACE AREA / FLOOR AREA RATIO (Typical Floor) ( 15,033.14 / 17,728 ) =</b>									<b>0.85</b>



**APPENDIX C**

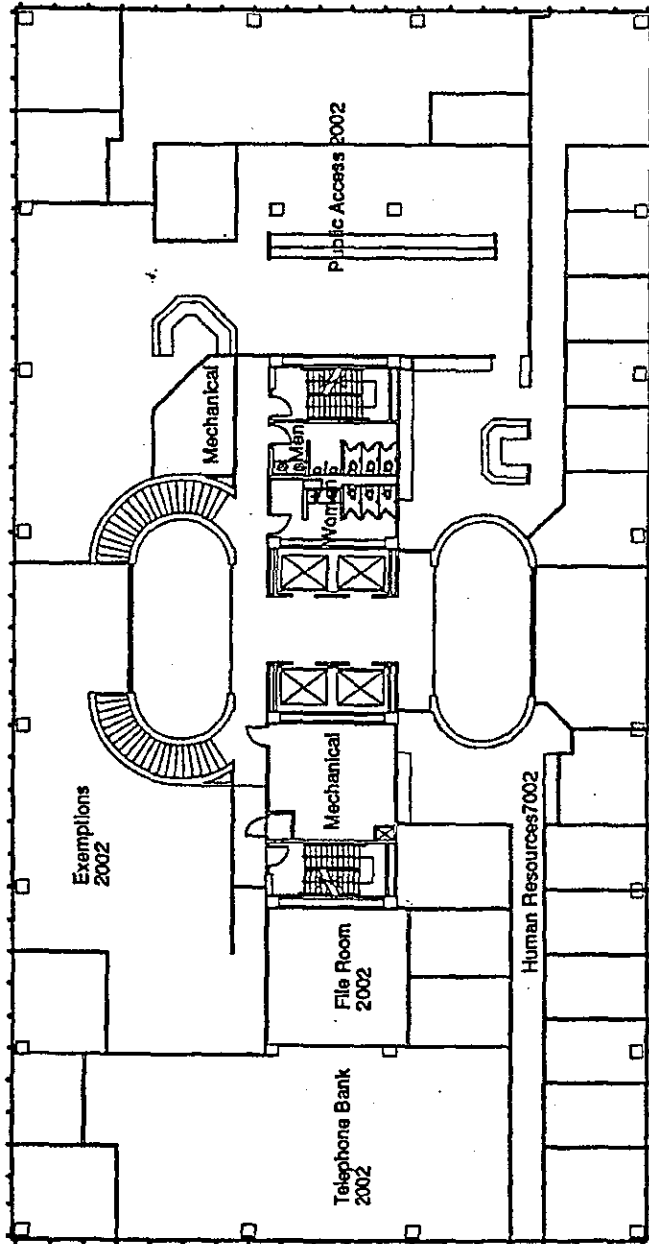
## **APPENDIX C**

### **REDUCED BUILDING DRAWINGS**



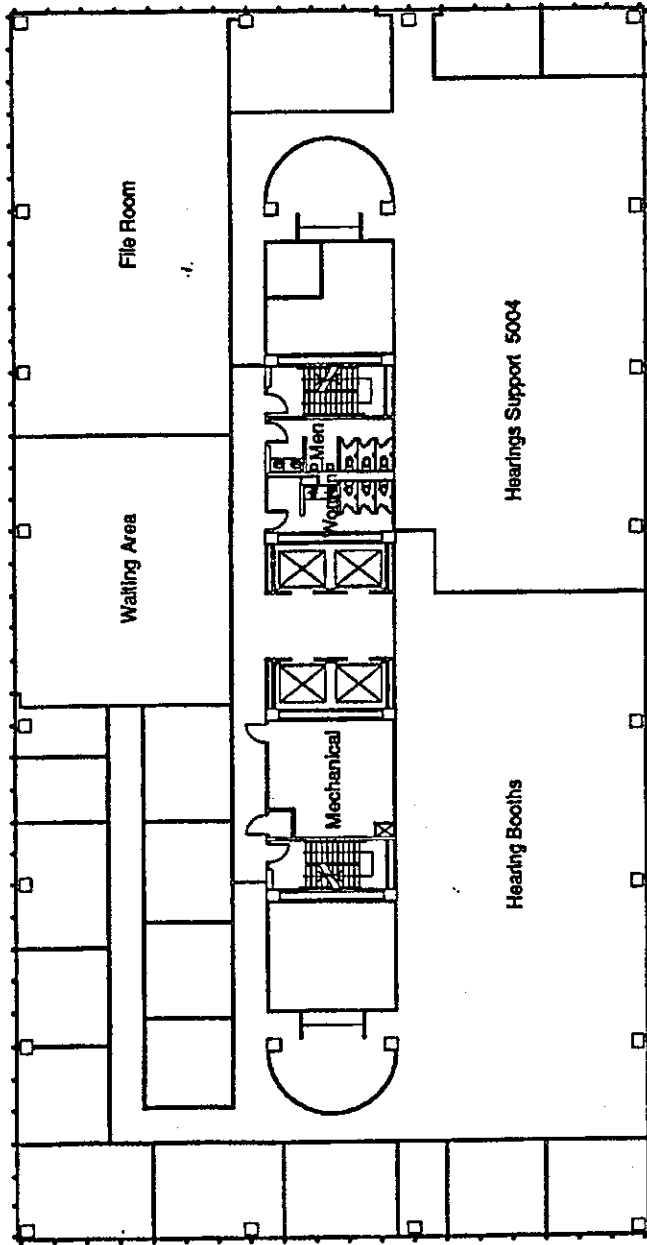
Existing Facilities @ 2800 North Loop West - Houston  
Harris County Appraisal District

Ground Floor Level

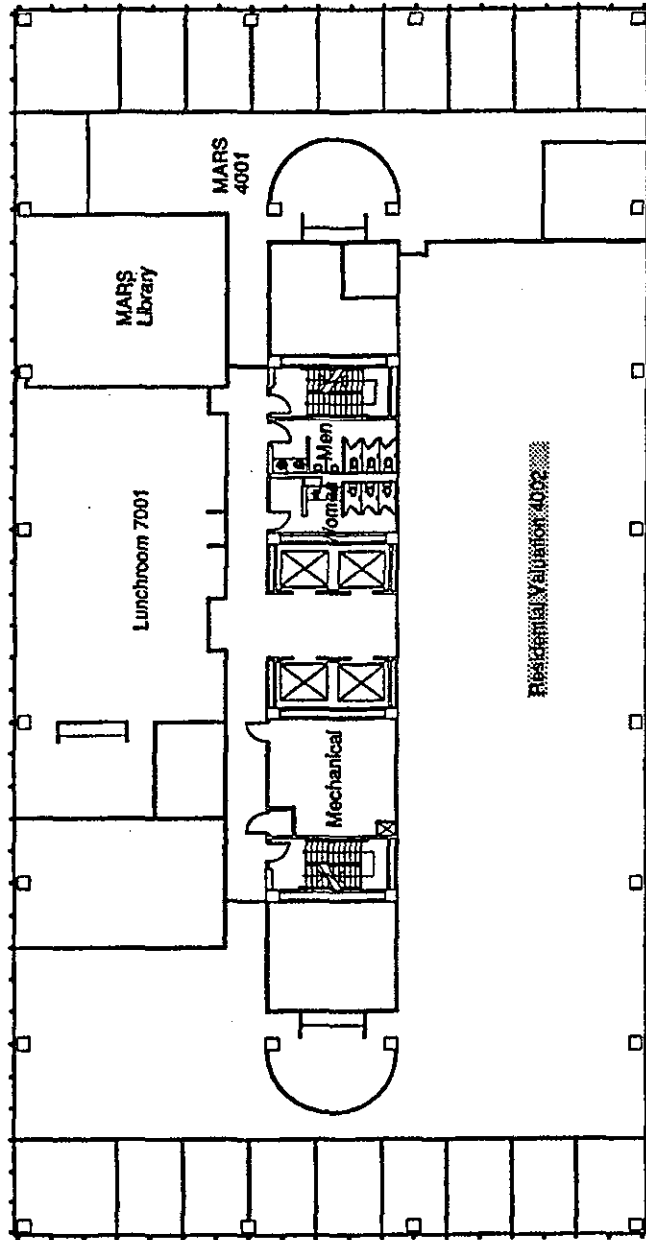


Existing Facilities @ 2800 North Loop West - Houston  
Harris County Appraisal District

First Floor Level



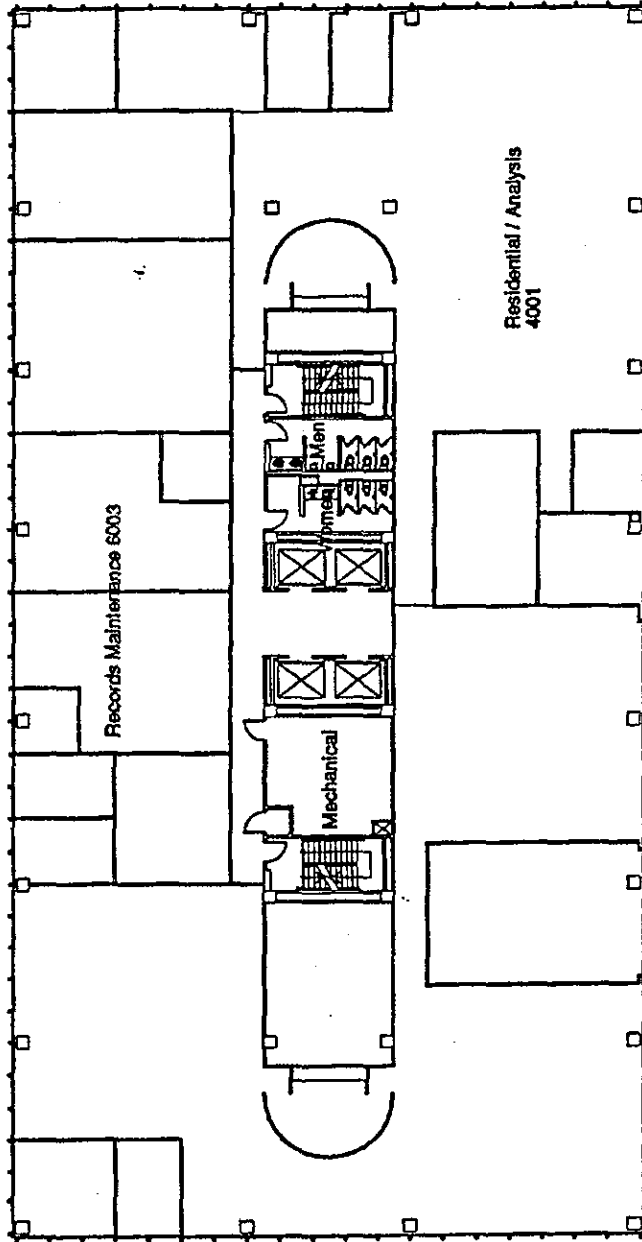
Existing Facilities @ 2800 North Loop West - Houston  
Harris County Appraisal District  
Second Floor Level



Existing Facilities @ 2800 North Loop West - Houston  
Harris County Appraisal District

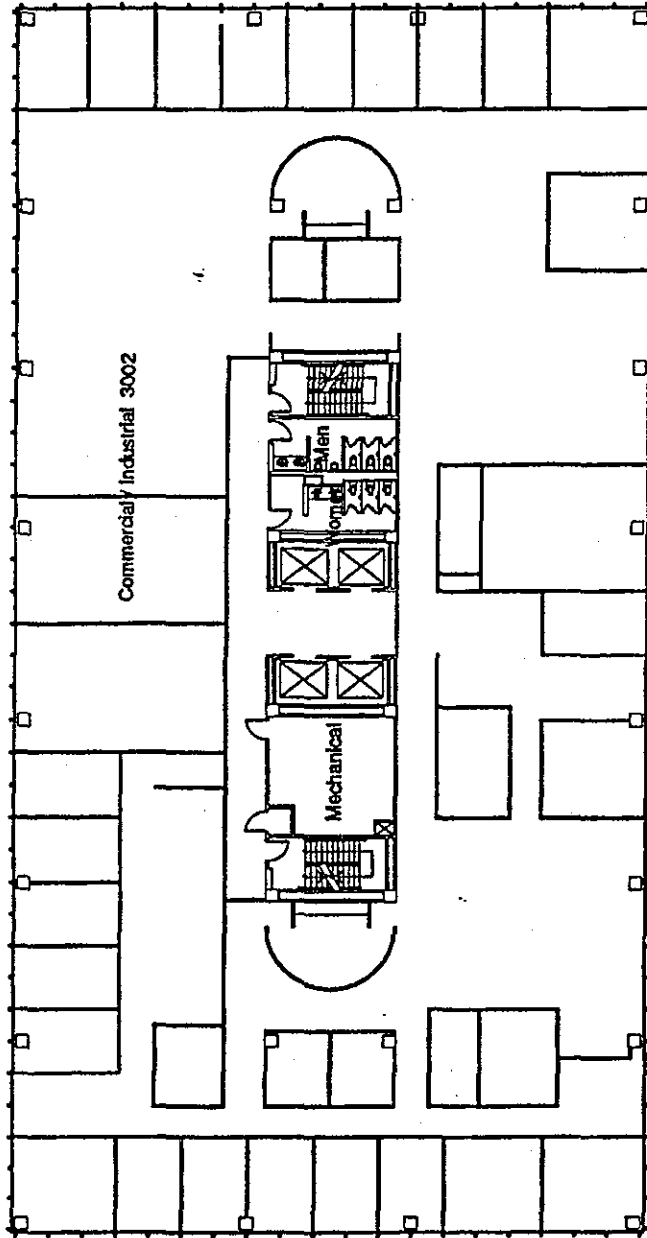
Third Floor Level





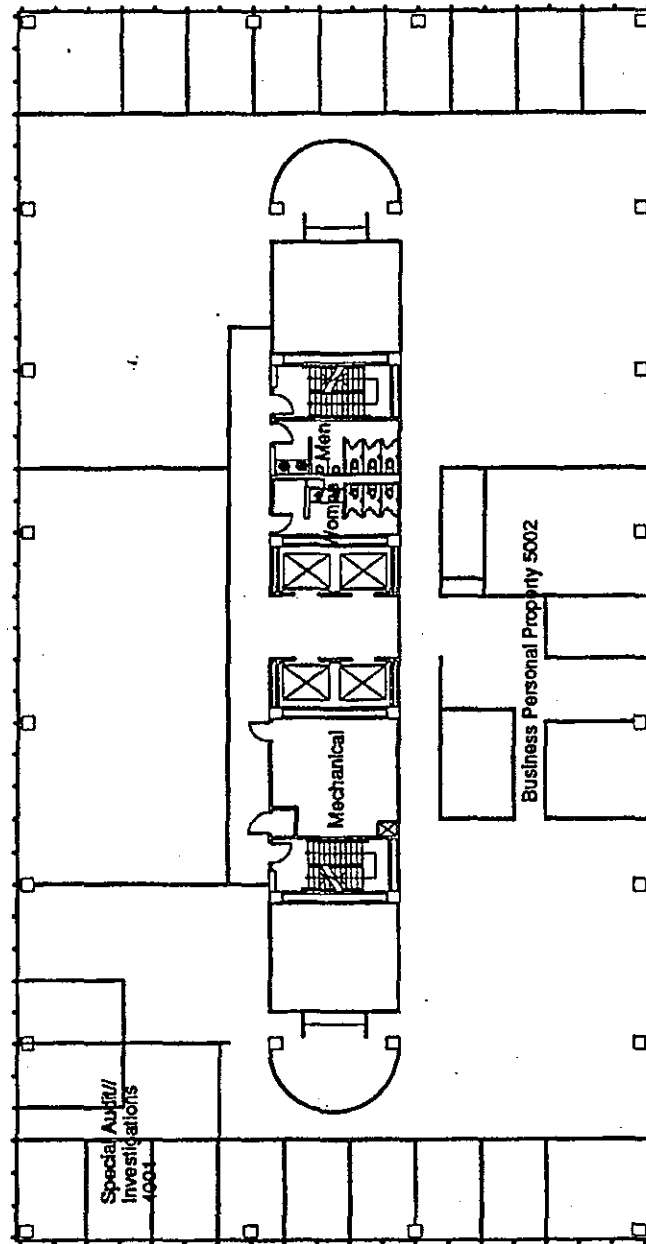
Existing Facilities @ 2800 North Loop West - Houston  
Harris County Appraisal District

Fourth Floor Level



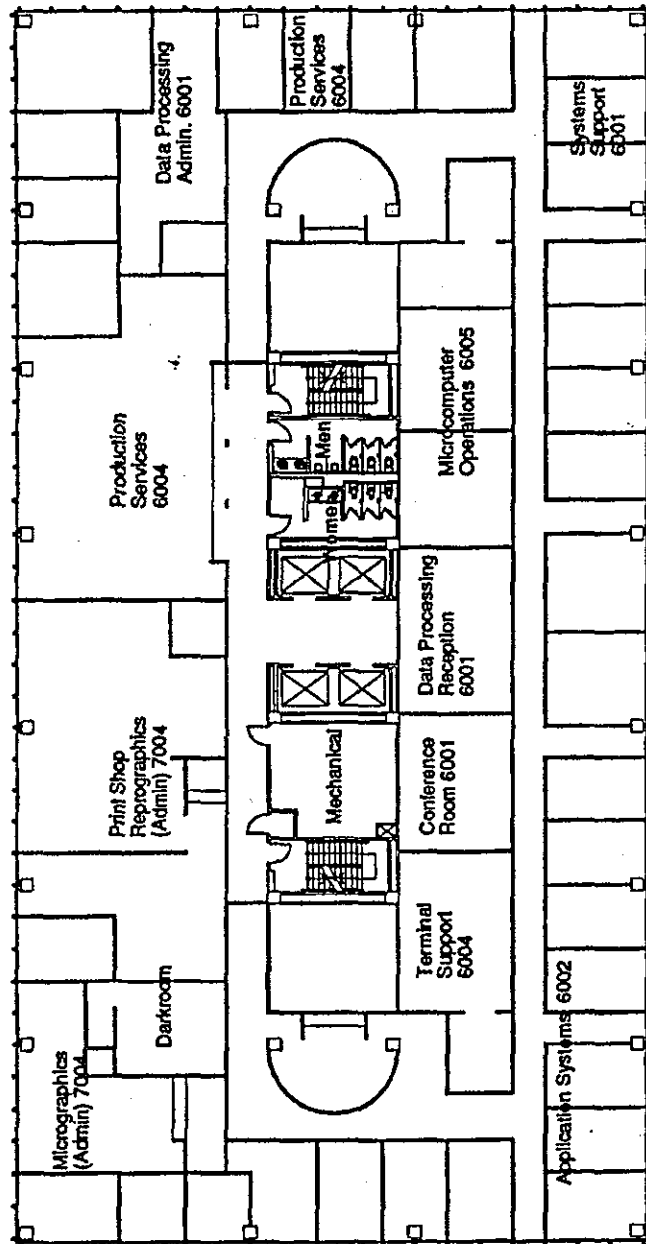
Existing Facilities @ 2800 North Loop West - Houston  
Harris County Appraisal District

Fifth Floor Level



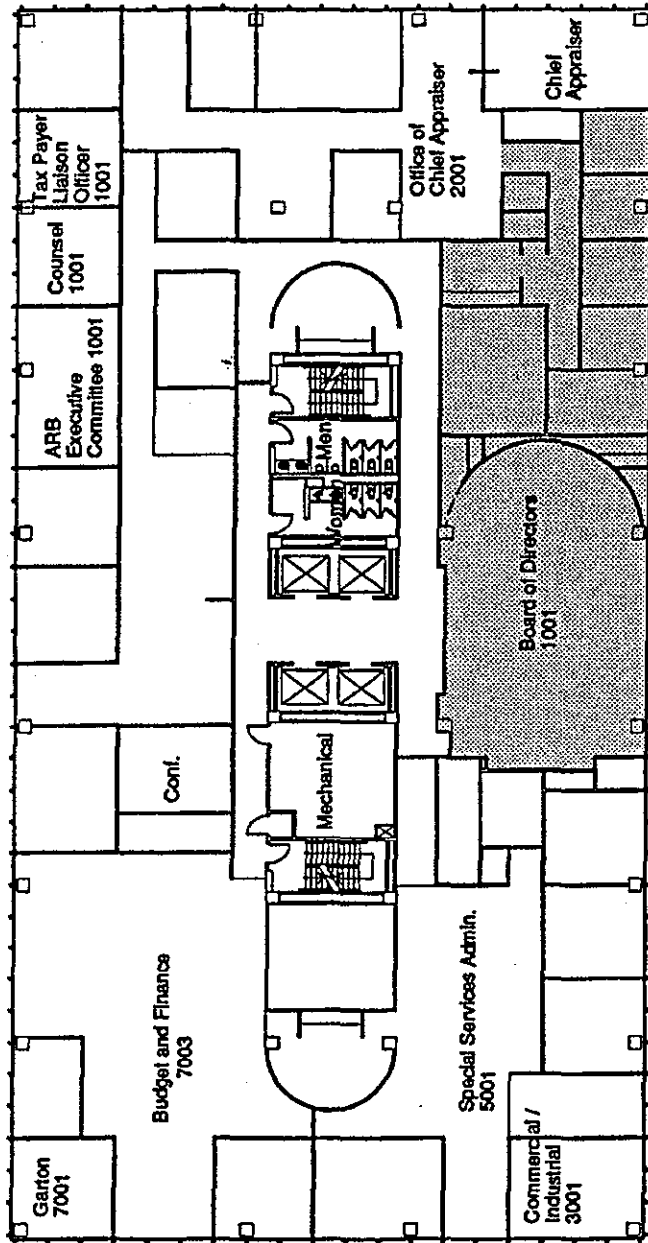
Existing Facilities @ 2800 North Loop West - Houston  
Harris County Appraisal District

Sixth Floor Level



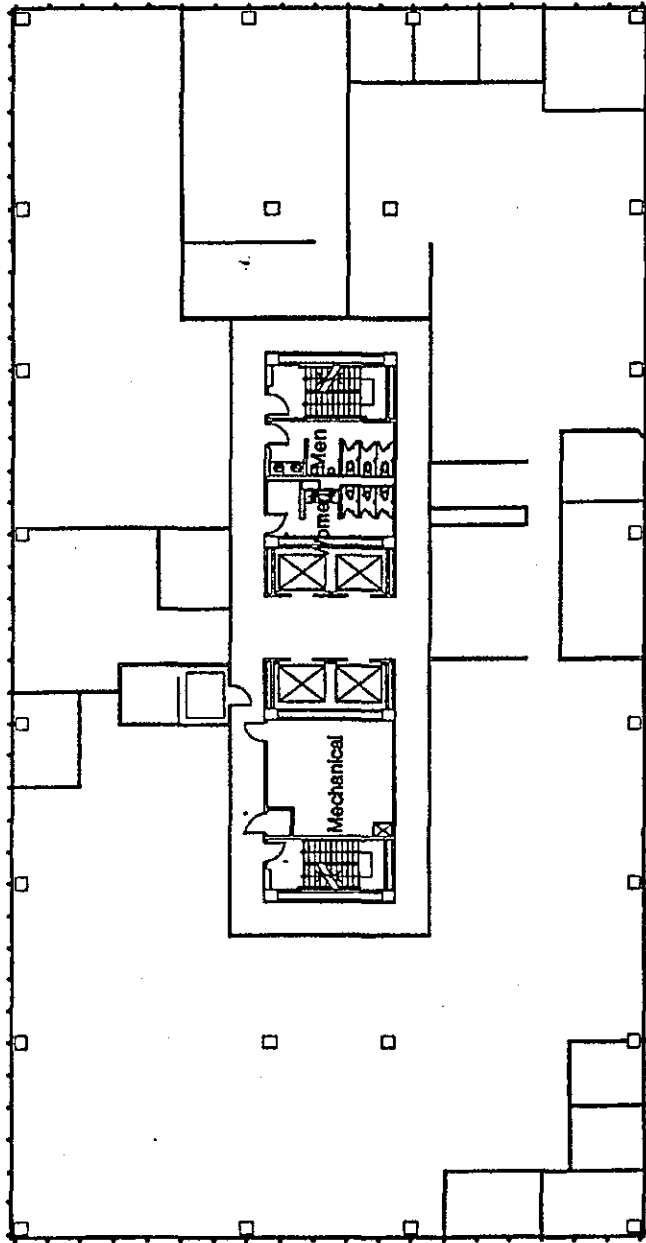
Existing Facilities @ 2800 North Loop West - Houston  
Harris County Appraisal District

Seventh Floor Level



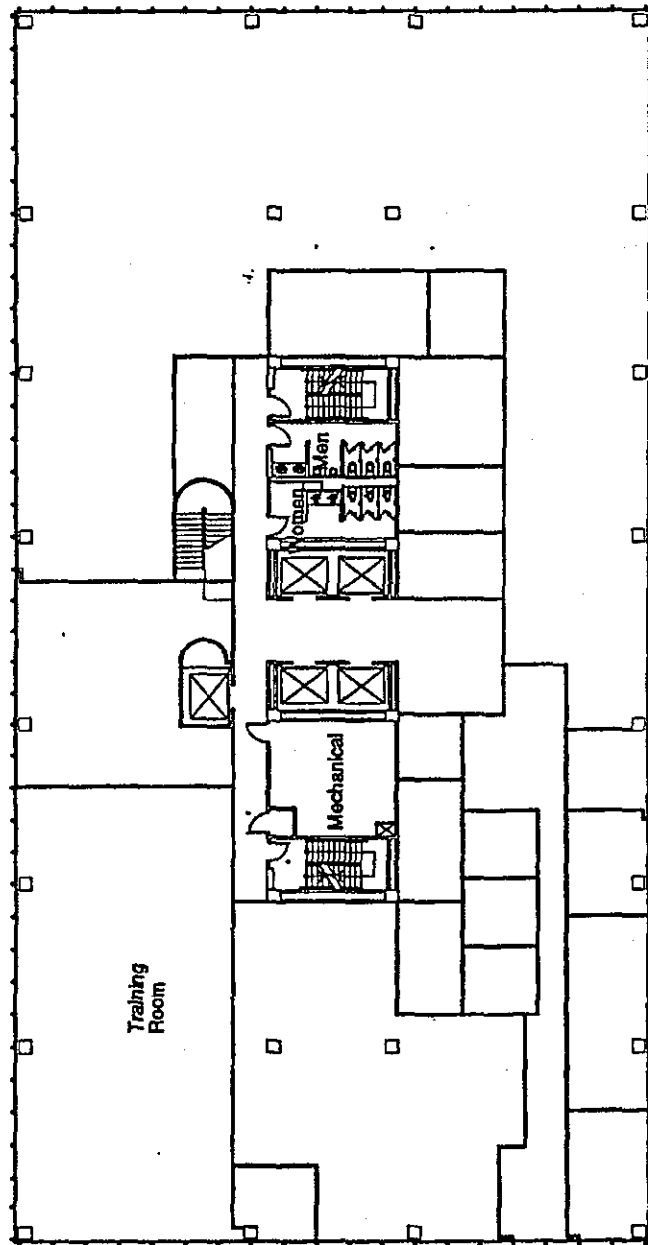
Existing Facilities @ 2800 North Loop West - Houston  
Harris County Appraisal District

Eighth Floor Level



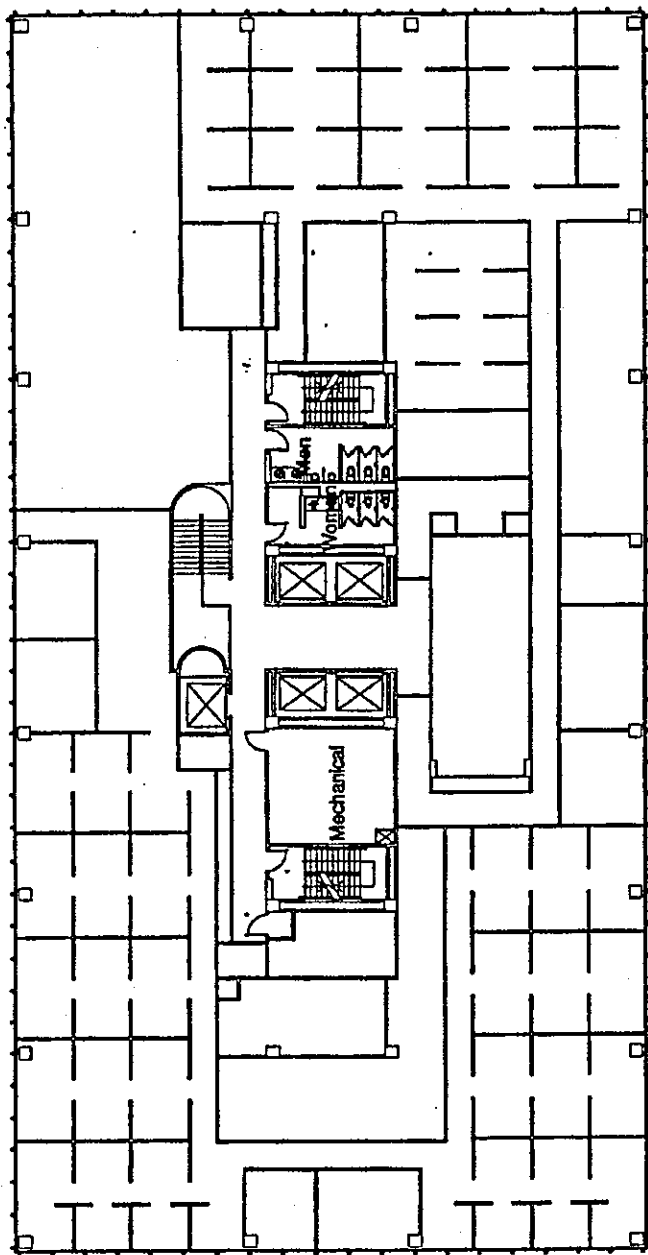
Existing Facilities @ 2800 North Loop West - Houston  
Harris County Appraisal District

Ninth Floor Level



Existing Facilities @ 2800 North Loop West - Houston  
Harris County Appraisal District

Tenth Floor Level



Existing Facilities @ 2800 North Loop West - Houston  
Harris County Appraisal District

Eleventh Floor Level



Revisions		LOC	Description
Rev	Date	Rev	
		to 0-10	Industry And Pro-Gene
A	0-10-10		REV And addendum 1 (Rev 0)
		to 1-10	REV And addendum 2 (Rev 0)
A	1-10-10		Rev 0 and addendum 3 (Rev 0)
		to 2-10	Rev 0 and addendum 4 (Rev 0)
A	2-10-10		Rev 0 and addendum 5 (Rev 0)
		to 3-10	Rev 0 and addendum 6 (Rev 0)
A	3-10-10		Rev 0 and addendum 7 (Rev 0)
		to 4-10	Rev 0 and addendum 8 (Rev 0)
A	4-10-10		Rev 0 and addendum 9 (Rev 0)
		to 5-10	Rev 0 and addendum 10 (Rev 0)
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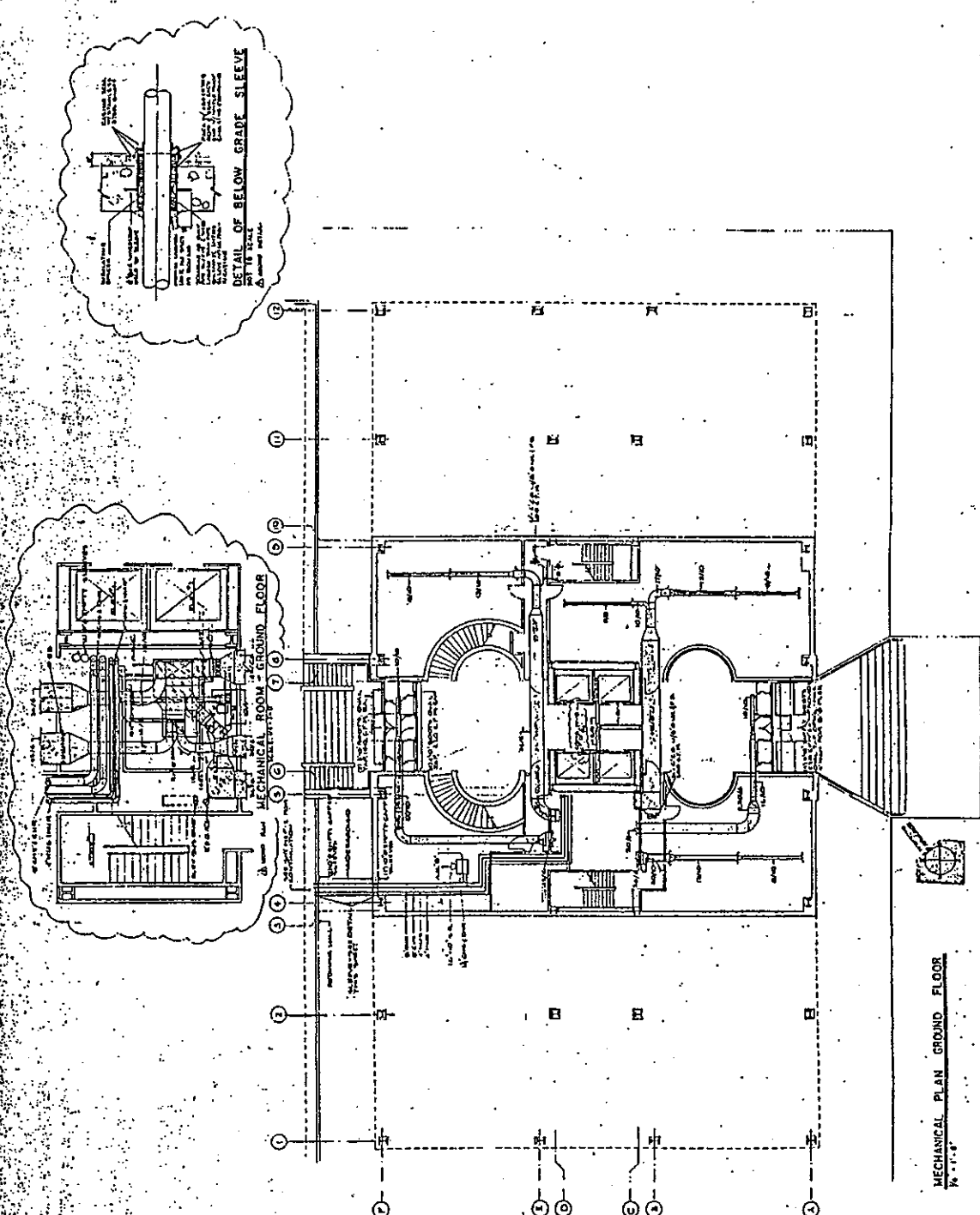
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Architects  
Planning Consultants  
Houliaton  
New York

**Eller Engineers Inc.**  
structural engineers  
Chenevix and Brady  
consulting engineers  
Prest Construction Co.  
general contractor

Brookhollow  
Golden Center  
Houston, Texas

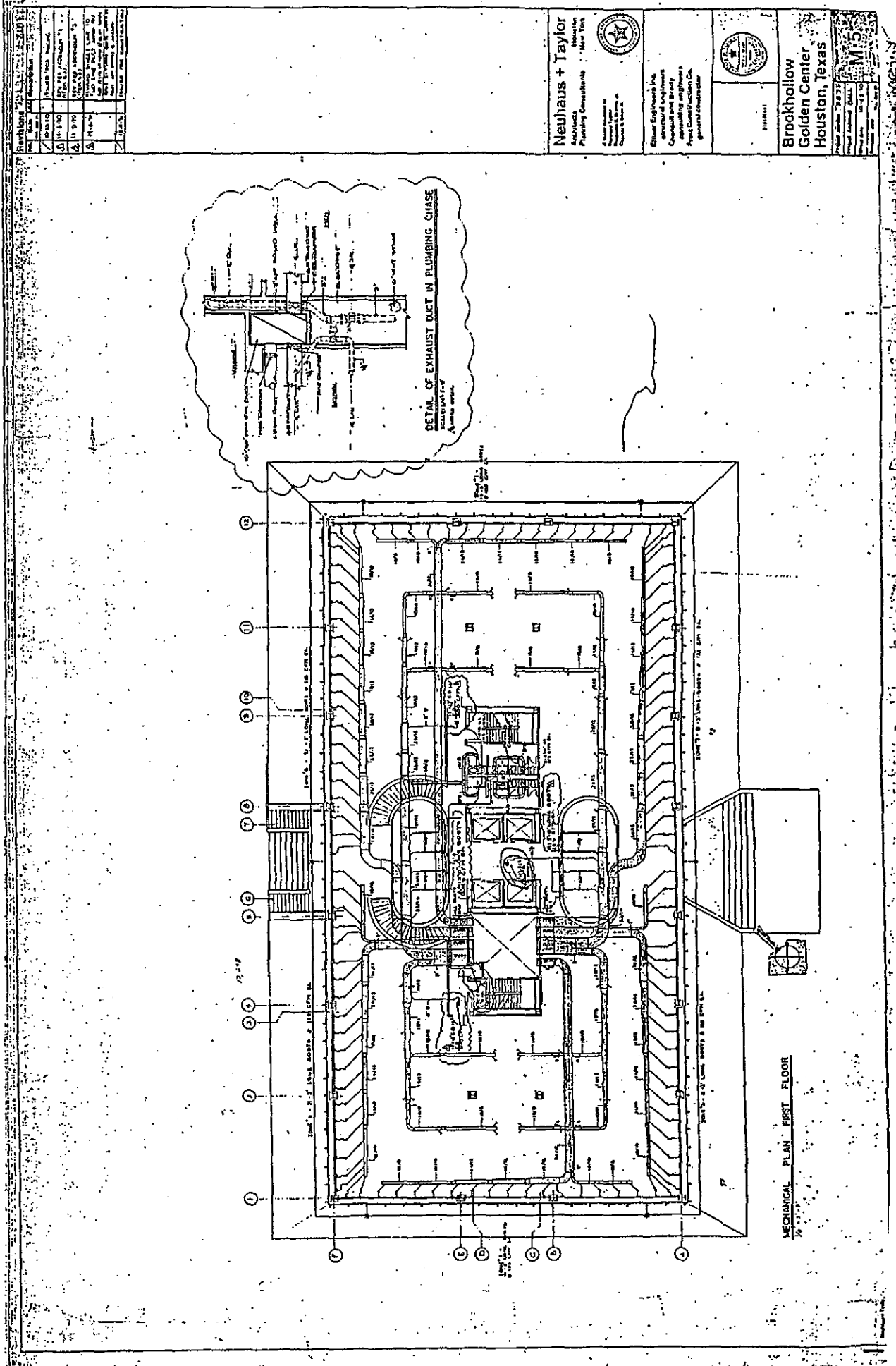
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Page	1

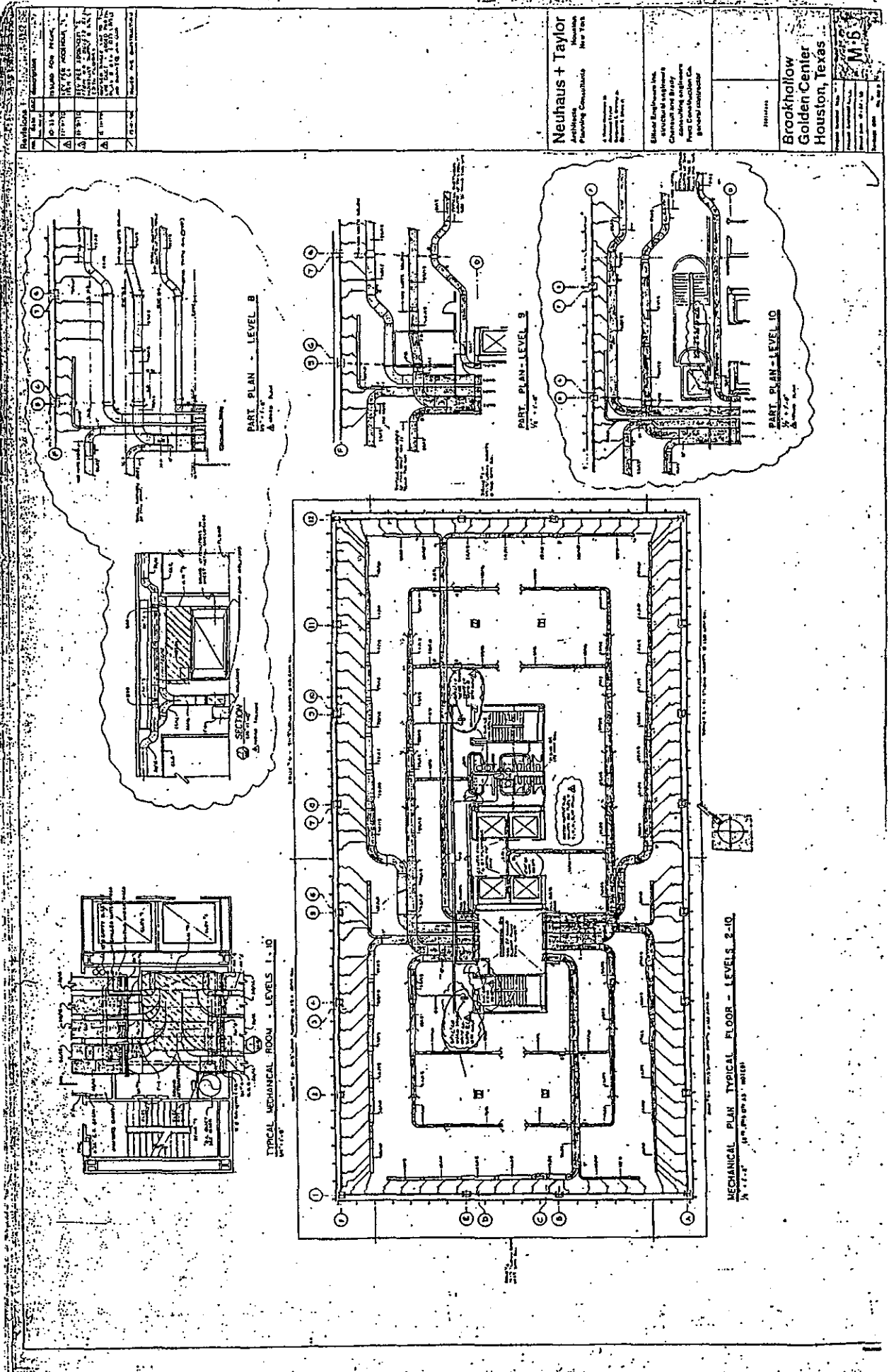
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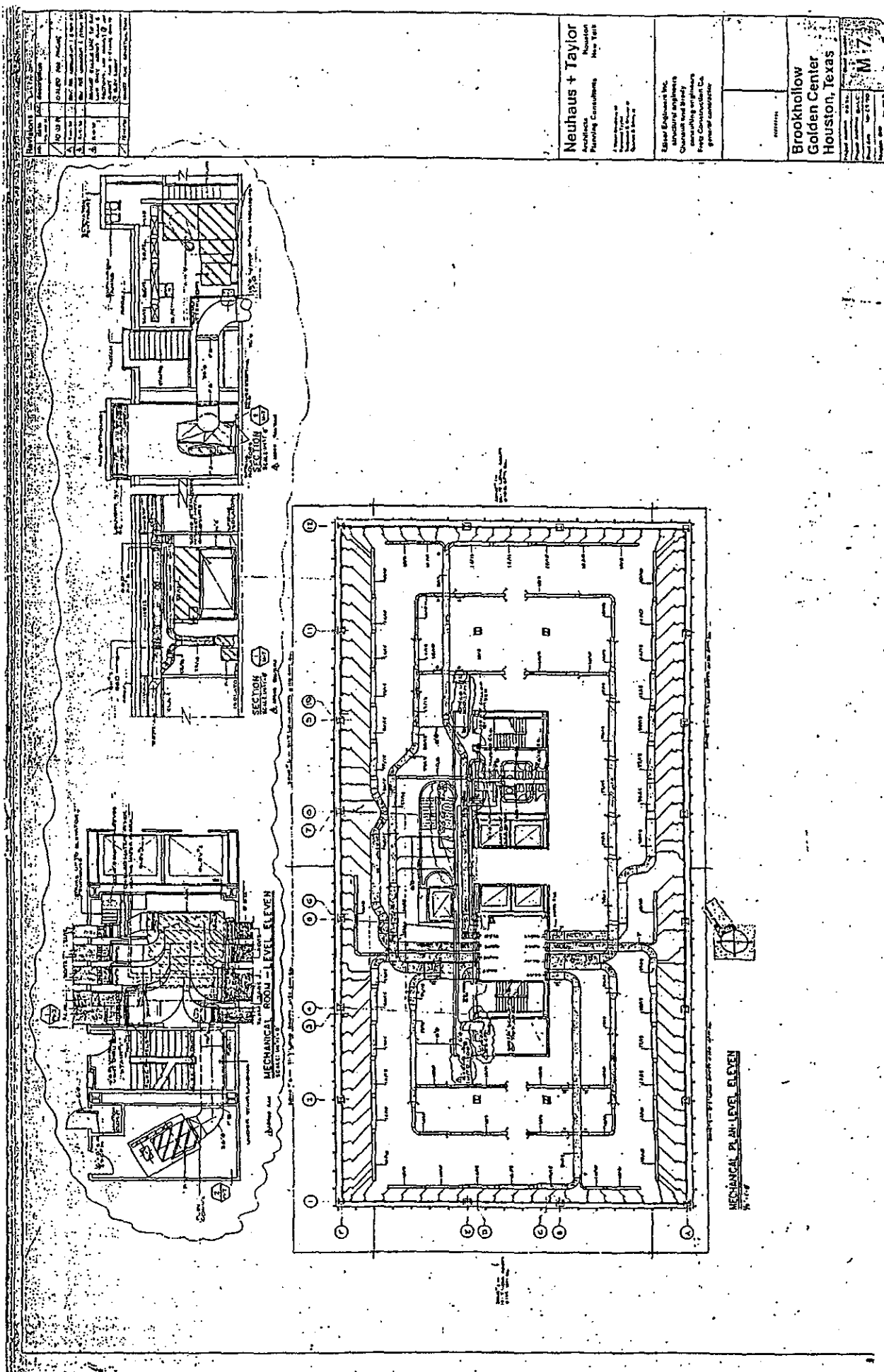


MECHANICAL PLAN GROUND FLOOR

**4411** **4411**









ADDENDUM TO PROOF OF CLAIM- EXHIBIT C  
BROOKHOLLOW I

**Halliwell Backup re: Brookhollow I**

<b><u>Date</u></b>	<b><u>Description</u></b>
	<b><u>Respray Brookhollow</u></b>
10/25/85	Asbestos Survey Report for Prudential Property 941-941, Brookhollow Golden prepared by BCM Converse
	<b><u>Brookhollow WT Stephens Submittal Information</u></b>
	Site Considerations and Preparation prepared by W.T. Stephens Contracting
	Respiratory Protection Program
	<b><u>Brookhollow 1 Cost File</u></b>
1/16/86	Application and Certificate for Payment for W.T. Stephens Contracting, amount certified \$213,030 (includes backup)
2/3/86	Application and Certificate for Payment for W.T. Stephens Contracting, amount certified \$213,196.50 (includes backup)
2/19/86	Application and Certificate for Payment for W.T. Stephens Contracting, amount certified \$377,773.50 (includes backup)
3/17/86	Application and Certificate for Payment for W.T. Stephens Contracting, amount certified \$60,000 (includes backup)
3/14/86	Application and Certificate for Payment for W.T. Stephens Contracting, amount certified \$131,175 (includes backup)
3/31/86	Application and Certificate for Payment for W.T. Stephens Contracting, amount certified \$155,677.50 (includes backup)
4/30/86	Application and Certificate for Payment for W.T. Stephens Contracting, amount certified \$136,125 (includes backup)
4/15/86	Application and Certificate for Payment for W.T. Stephens Contracting, amount certified \$228,172.50 (includes backup)

ADDENDUM TO PROOF OF CLAIM- EXHIBIT C  
BROOKHOLLOW I

<u>Date</u>	<u>Description</u>
5/15/86	Application and Certificate for Payment for W.T. Stephens Contracting, amount certified \$82,450 (includes backup)
6/18/86	Application and Certificate for Payment for W.T. Stephens Contracting, amount certified \$25,200 (includes backup)
6/30/86	Application and Certificate for Payment for W.T. Stephens Contracting, amount certified \$10,200 (includes backup)
1/31/86	BCM Invoice # 1-105 in the amount of \$32,560
2/25/86	BCM Invoice # 2-155 in the amount of \$16,280
3/28/86	BCM Invoice # 3-282 in the amount of \$16,280
4/30/86	BCM Invoice # 4-489 in the amount of \$72,660
9/9/86	BCM Invoice # 9-996 in the amount of \$39,744
5/30/86	Property Management Systems Invoice # 028784 in the amount of \$20,000
	Record of Pay Requests to W.T. Stephens
1/3/86	BCM Converse letter to Property Management Systems re: Asbestos Abatement enclosing Contractor's proposal
1/6/86	Agreement between W.T. Stephens Contracting and Property Management Systems
12/18/85	Letter Agreement between Owner and Engineer for Professional Services in connection with Asbestos Related Services between Property Management Systems, agent for Prudential Insurance Company of America and BCM Converse, Inc.
1/10/86	BCM Converse letter to Property Management Systems re: Asbestos Removal enclosing proposal

Waste Disposal Records

Asbestos Waste Disposal Notifications sent to Texas Department of Health for the period 1/7-31/86

ADDENDUM TO PROOF OF CLAIM- EXHIBIT C  
BROOKHOLLOW I

<u>Date</u>	<u>Description</u>
	<b><u>Brookhollow: Air Monitoring</u></b>
2/5/86	BCM Converse letter to W.T. Stephens re: Brookhollow Golden 1 asbestos removal on floors 2 and 4
1/25/88	BCM Converse letter to Property Management Systems confirming removal of asbestos-containing fireproofing material from Brookhollow 1
12/85	Contract Documents -- Asbestos Removal for Brookhollow Golden 1, Houston, Texas prepared by BCM Converse
	<b><u>Brookhollow Meeting Notes</u></b>
	Handwritten notes for the period 1/3-2/27/86
	<b><u>Brookhollow Consultant's Daily Logs</u></b>
	Investigator's Survey Check List, (BCM Converse) of Brookhollow Golden 1 contractor W.T. Stephens for the period Jan.-May 1986
	<b><u>Brookhollow Contractor's Daily Logs</u></b>
	Undated Daily Project Logs
	<b><u>Brookhollow 1 Spec. Project File</u></b>
1/20/86	BCM Converse letter to Property Management Systems re: Brookhollow Golden 1 Asbestos Abatement enclosing job summary and description of the air monitoring report for the project through 1/17/86
	BCM Converse Air Monitoring Data Report for the period 1/7-3/25/86
	Job Summary Report -- Brookhollow Golden 1, January 6-17, 1986
3/28/86	BCM Converse letter to Property Management Systems re: Brookhollow Golden 1, Phase 1 enclosing copy of the BCM Air Monitoring sheet and the Procedure for Fiber Counting
	<b><u>Leasing Plan &amp; Reduced Design</u></b>
	Various diagrams and drawings of the existing facilities
	<b><u>Survey</u></b>
2/6/86	BCM Converse letter to Property Development Services re: Brookhollow



ADDENDUM TO PROOF OF CLAIM- EXHIBIT C  
BROOKHOLLOW I

<u>Date</u>	<u>Description</u>
	Golden 1 enclosing report of Rolf Jensen & Associates on the fireproofing requirements for the structural steel
4/18/86	BCM Converse letter to Property Management Services re: Fireproofing Materials, Brookhollow Golden enclosing contractor's submittal - Cafco
1/17/86	Brookhollow Golden Center Fireproofing Systems prepared by Rolf Jensen & Associates
1/22/86	Letter from Rolf Jensen & Associates to BCM Converse re: Brookhollow Golden Center - review of structural drawings and Houston Building Code for the structural fire protection
4/16/86	Letter from Rolf Jensen & Associates to BCM Converse enclosing UBC Standard No. 43-8
1/9/86	Letter from Rolf Jensen & Associates to BCM Converse re: Brookhollow Golden Center enclosing proposal to provide fire protection engineering consulting services
1/10/86	BCM Converse letter to Rolf Jensen & Associates re: Brookhollow Golden enclosing executed copy of proposal to provide fire protection engineering consulting services
1/15/86	Letter from W.T. Stephens to BCM Converse re: Brookhollow Golden 1 - Survey on Fireproofing
2/7/86	Letter from Building Specialties Inc. to W.T. Stephens re: Brookhollow One, Spray-On Fire Proofing

3251635.01

## EXHIBIT D

Brookhollow I  
Houston, TX  
(W.R. Grace)

**TABLE 2**  
**Summary of Completed Asbestos Fireproofing**  
**Removal and Replacement Net Costs**

<b>PROJECT INFORMATION</b>	
Floor(s)	Ground - 11th
Asbestos Abatement Dates	01/86 - 07/86
Asbestos Abatement Contractor	W.T. Stephens
Asbestos Abatement Consultant	BCM Converse
Project Floor Area (square feet)	202,049
<b>GROSS ABATEMENT PROJECT COSTS (1)</b>	
Asbestos Abatement Contractor	\$1,587,800.00
Asbestos Abatement Consultant	177,524.00
Management Fee	20,000.00
Total Gross Abatement Project Costs	\$1,785,324.00
Total Cost per square foot of Floor Area	\$8.84
<b>DEDUCTIONS FOR NON FIREPROOFING</b>	
<b>PROJECT COSTS (NON-FP)</b>	
Vinyl Asbestos Floor Tile (VAT) Removal (2)	\$0.00
Thermal System Insulation (TSI) Removal (3)	0.00
Miscellaneous Project Cost Deductions (4)	2,800.00
Total Project Deductions	\$2,800.00
<b>CONTAMINATED BUILDING</b>	
<b>COMPONENT REPLACEMENT COSTS (5)</b>	
Ceilings	\$0.00
Light Fixtures	0.00
Ductwork	0.00
Total Contaminated Bldg. Component Replacement Cost	\$0.00
<b>TOTAL NET PROJECT COSTS</b>	
Total Net Project Costs	\$1,782,524.00
Total Net Project Cost Per Sq. Ft. of Floor Area	\$8.82

**NOTES:**

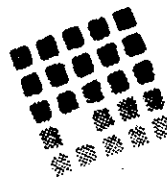
- (1) Refer to Table 3 for detailed listing of Gross Abatement Project Costs.
- (2) No VAT removal required per the project plans or specifications, therefore deduct = \$0.
- (3) No TSI removal required per the project plans or specifications, therefore deduct = \$0.
- (4) Refer to Table 3 for detailed listing of Miscellaneous Project Cost Deductions.
- (5) Refer to Table 5 for details of costs not included in this report.

**TABLE 3**  
**Detailed Costs for Completed Asbestos Fireproofing Removal and Replacement Projects**

Floor No.	Vendor	Invoice No.	Invoice Date	Total Invoice	Non FP	Description
Grd-6	W.T. Stephens	App #1	01/16/86	\$213,030.00		Asbestos Abatement. Original Contract Value = \$814,000.00 for asbestos abatement (Ground-6th).
Grd-6	W.T. Stephens	App #2	02/03/86	213,196.50		Asbestos Abatement.
Grd-6	W.T. Stephens	App #3	02/19/86	377,773.50		Asbestos Abatement.
Grd-6	W.T. Stephens	App #4	03/03/86	60,000.00		Asbestos Abatement. (Includes C.O.#1 for \$50,000 to remove extra layer of carpet; replace drywall removed for access to remove fireproofing; provide tenant access and isolation; reduce re-fireproofing from 3 hour to 2 hour; accelerate schedule; removal and replacement of fireproofing behind brick soffit in the lobby; provide conditioned air to tenants on the 4th floor).
7-11th	W.T. Stephens	App #5	03/14/86	131,175.00		Asbestos Abatement (includes CO #2 for \$741,000.00 for asbestos removal flrs 7-11).
7-11th	W.T. Stephens	App #6	03/31/86	155,677.50		Asbestos Abatement.
7-11th	W.T. Stephens	App #7	04/15/86	228,172.50		Asbestos Abatement.
7-11th	W.T. Stephens	App #8	04/30/86	136,125.00		Asbestos Abatement.
7-11th	W.T. Stephens	App #9	05/15/86	37,250.00		Asbestos Abatement.
7-11th	W.T. Stephens	App #10	06/18/86	25,200.00		Asbestos Abatement.
7-11th	W.T. Stephens	App #11	06/30/86	10,200.00	x	Asbestos Abatement (includes CO #3: backcharge (\$20,000.00) misc. repairs caused by W.T. Stephens damage during abatement. CO #4: \$2,800.00 for furniture disposal).
						Misc. deduct = \$2,800.00
		Contractor Subtotal =		\$1,587,800.00		Total Contract Value = \$814,000.00 (P.O.) + \$773,800.00 (CO's) = \$1,587,800.00
Grd-6th	BCM Converse	1-105	01/31/86	\$32,560.00		Design and project management through 01/16/86.
Grd-6th	BCM Converse	2-155	02/25/86	16,280.00		Design and project management through 01/31/86.
Grd-6th	BCM Converse	3-282	03/28/86	16,280.00		Project management through 02/27/86.
7-11th	BCM Converse	4-489	04/30/86	72,660.00		Project management through 04/10/86.
7-11th	BCM Converse	9-996	09/09/86	39,744.00		Project management through 07/17/86.
		Consultant Subtotal =		\$177,524.00		
Grd-11th	Prop Mgt System	028784	05/30/86	\$20,000.00		Management fee for asbestos abatement.
		Prop. Mgt. Subtotal =		\$20,000.00		
		Gross Abatement Project Costs =		\$1,785,324.00	x	Total Miscellaneous Deduct = \$2,800.00 (Deducted on Table 2).

Brookhollow I  
Houston, TX  
(W.R. Grace)

## EXHIBIT E



**MATERIALS  
ANALYTICAL  
SERVICES** \*

July 11, 1990

Re: Brookhollow I  
Houston, Texas

Based on the constituent analysis of the fireproofing samples for the above-referenced project, it is my opinion that the samples analyzed are Mono-Kote 3, which was manufactured by W. R. Grace.

Worksheets reflecting our analysis are attached.

  
William E. Longo, Ph.D.

PIS 00061057

3597 Parkway Lane • Suite 251  
Norcross, Georgia 30092  
(404) 448-3200 FAX (404) 448-3256

**BUILDING:** Brookhollow I  
Houston, Texas

The following bulk samples from the above-referenced buildings were analyzed and were used to form an opinion of the manufacturer and product.

<u>Bulk Sample #</u>	<u>Sample Location</u>
10	4th Floor Support NW Elevator Shaft
16	5th Floor Support NW Elevator Shaft
18	6th Floor Support NW Elevator Shaft
23	7th Floor Support NW Elevator Shaft

## MATERIALS ANALYTICAL SERVICES, INC.

## BULK ASBESTOS SHEET

Project # - Spl #: M3825-10Date: 3/7/90Project Name: PRUDENTIALAnalyst: W.B. EganSample Identification: BROOKHOLM #4-1 4TH FLOOR SUPPORTNW ELEVATOR FIRE PROOFING

Gross Visual Description: LIGHT BEIGE. GOLD FLAKES AND DUSTS AS WELL AS FIBERS BOUND BY AN ABUNDANT FINE MATRIX. RUSTED PIECES OF METAL ARE ATTACHED TO ONE SIDE.

## Optical Data for Asbestos Identification

Morphology	.....	.....	.....	.....	.....	.....
Pleochroism	.....	.....	.....	.....	.....	.....
Refractive Index	.....	(1.10)	.....	.....	.....	.....
Sign of Elongation	.....	.....	.....	.....	.....	.....
Extinction	.....	.....	.....	.....	.....	.....
Birefringence	.....	.....	.....	.....	.....	.....
Melt	.....	.....	.....	.....	.....	.....
Fiber Name	.....	.....	.....	.....	.....	.....

## ASBESTOS MINERALS:

Est. Vol. %

Chrysotile ..... 8  
 Amphibole .....  
 Crocidolite .....  
 Tremolite/Actinolite .....  
 Anthophyllite .....

## OTHER FIBROUS COMPONENTS:

Mineral/Rock wool .....  
 Fibrous glass .....  
 Cellulose .....  
 Synthetic .....  
 Other .....

## NON-FIBROUS COMPONENTS:

Perlite .....  
 Vermiculite ..... 35  
 Other .....

Binders ..... 57

ABUNDANT GYPSUM WITH SCATTERED CARBONATE AND OTHER ASSOCIATED GRANULAR MINERALS.

EFFERVESCENCE: WEAK IN ISOLATED AREAS

## COMMENTS:

NO STARCH OBSERVED



## MATERIALS ANALYTICAL SERVICES, INC.

## BULK ASBESTOS SHEET

Project # - Spl #: M3825-16Date: 3/7/90Project Name: PRUDENTIALAnalyst: L.D. EysenckSample Identification: BROOK HOLLOW 120.47 # 5-35TH FLOOR SUPPORT - NW ELEVATOR SHAFTGross Visual Description: LIGHT BEIGE, GOLD BOOKS AND FLAKES AS WELL AS FIBERS BOUND BY AN ABUNDANT FINE MATRIX.

## Optical Data for Asbestos Identification

Morphology	.....	<u>WAVEY</u>	.....	.....
Pleochroism	.....	<u>NONE</u>	.....	.....
Refractive Index	.....	<u>(L/H) 1.54/1.55</u>	.....	.....
Sign of Elongation	.....	<u>+</u>	.....	.....
Extinction	.....	<u>parallel</u>	.....	.....
Birefringence	.....	<u>LOW</u>	.....	.....
Melt	.....	<u>NO</u>	.....	.....
Fiber Name	.....	<u>CHRYOTILE</u>	.....	.....

## ASBESTOS MINERALS:

## Est. Vol. %

Chrysotile ..... 10

Amosite ..... \_\_\_\_\_

Crocidolite ..... \_\_\_\_\_

Tremolite/Actinolite ..... \_\_\_\_\_

Anthophyllite ..... \_\_\_\_\_

## OTHER FIBROUS COMPONENTS:

Mineral/Rock wool ..... \_\_\_\_\_

Fibrous glass ..... \_\_\_\_\_

Cellulose ..... \_\_\_\_\_

Synthetic ..... \_\_\_\_\_

Other ..... \_\_\_\_\_

## NON-FIBROUS COMPONENTS:

Perlite ..... \_\_\_\_\_

Vermiculite ..... 35

Other ..... \_\_\_\_\_

Binders ..... 55

ABUNDANT GYPSUM WITH SCATTERED ASSOCIATED MINERALS.EFFERVESCENCE: WEAK IN ISOLATED AREAS

## COMMENTS:

NO STARCH OBSERVED.



## MATERIALS ANALYTICAL SERVICES, INC.

## BULK ASBESTOS SHEET

Project # - Spl #: 173825-23Date: 7/7/40Project Name: PRUDENTIALAnalyst: W. B. E.Sample Identification: DROCK HOLLOW 120.07 # 7-27<sup>TH</sup> FLOOR SUPPORT, N.W. ELEVATOR SHAFT

Gross Visual Description: LIGHT BEIGE. GOLD FLAKES AND BOGGS AS WELL  
AS FIBERS BOUND BY AN ABUNDANT FINE MATRIX, SMALL RUSTED  
PIECES OF METAL ARE ATTACHED.

## Optical Data for Asbestos Identification

Morphology	WAVEY
Pleochroism	NONE
Refractive Index	1.54/1.55
Sign of Elongation	+
Extinction	parallel
Birefringence	LOW
Melt	NO
Fiber Name	CHRYSOPILE

## ASBESTOS MINERALS:

## Est. Vol. %

Chrysotile . . . . . 8  
 Amphibole . . . . .  
 Crocidolite . . . . .  
 Tremolite/Actinolite . . . . .  
 Anthophyllite . . . . .

## OTHER FIBROUS COMPONENTS:

Mineral/Rock wool . . . . .  
 Fibrous glass . . . . .  
 Cellulose . . . . .  
 Synthetic . . . . .  
 Other . . . . .

## NON-FIBROUS COMPONENTS:

Perlite . . . . .  
 Vermiculite . . . . . 95  
 Other . . . . .

Binders . . . . . 57

ABUNDANT GYPSUM AND ASSOCIATED GRANULAR MINERALS.EFFERVESCENCE: WEAK IN WEAT- ISOLATED AREA

## COMMENTS:

NO STARCH OBSERVED



MATERIALS ANALYTICAL SERVICES, INC.  
3597 Parkway Lane, Suite 250  
Norcross, GA 30092  
404/448-3200

TEM ANALYSIS: *BULK ANALYSIS*

PROJECT: *PRUDENTIAL: BROOK HOLLOW*  
SAMPLE NUMBER: *M3825-10*  
SAMPLE ID: *4-1 PARKING GARAGE 4TH LEVEL*

DATE OF ANALYSIS: *6/22/90*

ANALYST: *W. B. Egan*

---

Asbestos Minerals: *CHRYSOCTILE (EDS)(DIFF)*

Other Components: *VERMICULITE (EDS)*  
*GIPSUM (EDS)(DIFF)*  
*STEEL PARTICLES (EDS)*

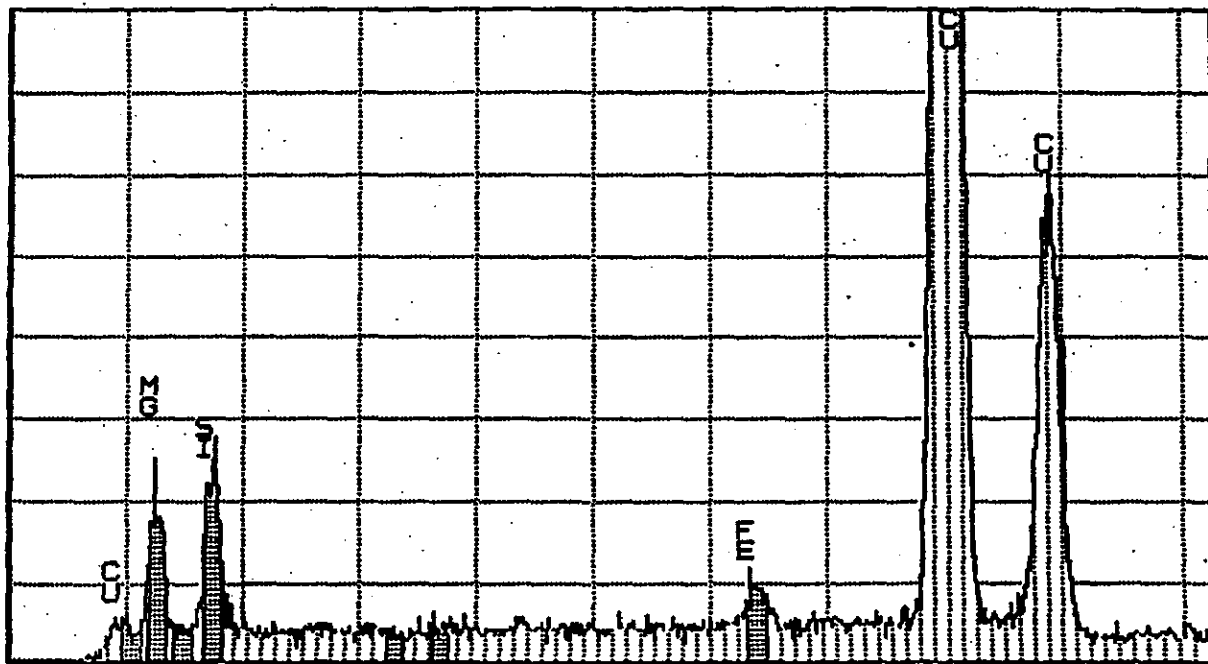
Comments:

MATERIALS ANALYTICAL SERVICES

FRI 22-JUN-90 10:28

Cursor: 0.000KeV = 0

ROI (SIKα) 1.660: 1.810=1012



0.000

VFS = 256

10.240

26

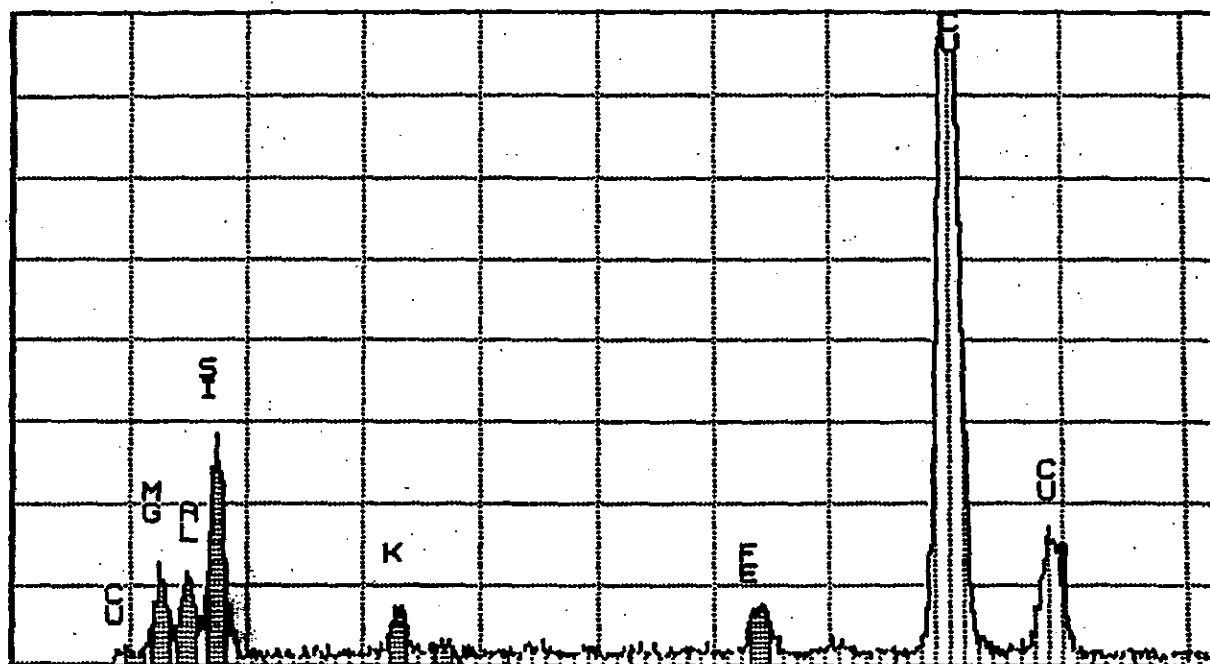
M3825-10. CHRYSOTILE

MATERIALS ANALYTICAL SERVICES

FRI 22-JUN-90 10:23

Cursor: 0.000keV = 0

ROI (SIK $\alpha$ ) 1.660: 1.810=1001



0.000

VFS = 256

10.240

88

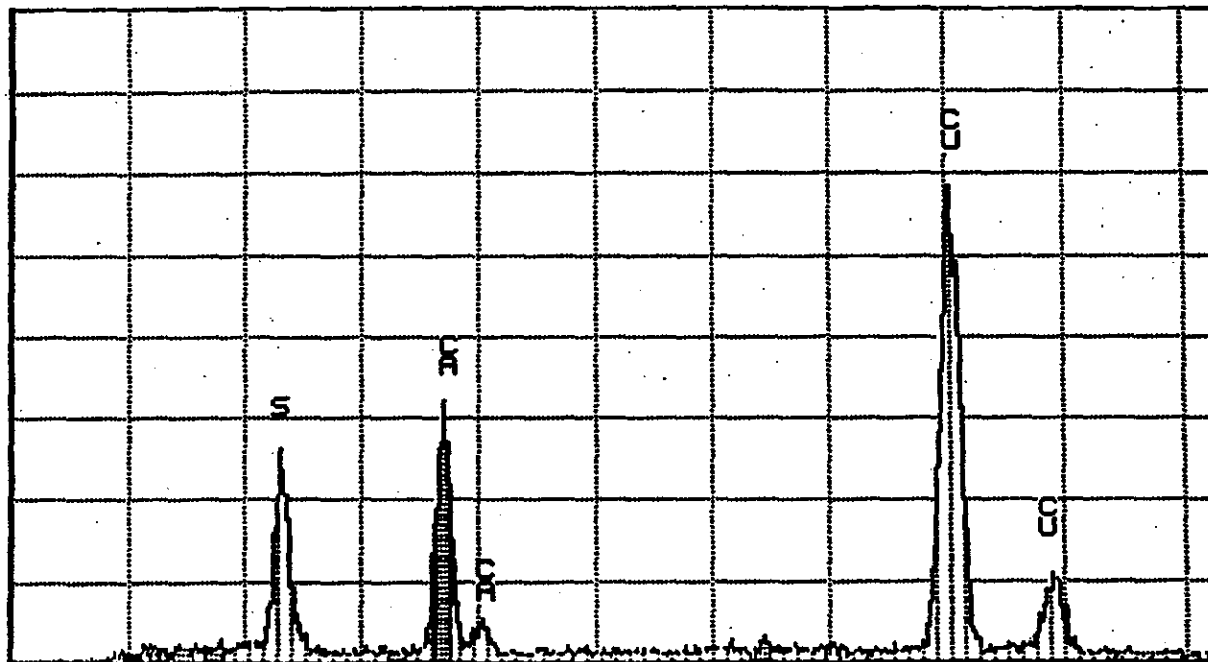
M3825-10, VERMICULITE

MATERIALS ANALYTICAL SERVICES

FRI 22-JUN-90 10:15

Cursor: 0.000KeV = 0

ROI (SIK $\alpha$ ) 1.660: 1.810=78



0.000

VFS = 256 10.240

40

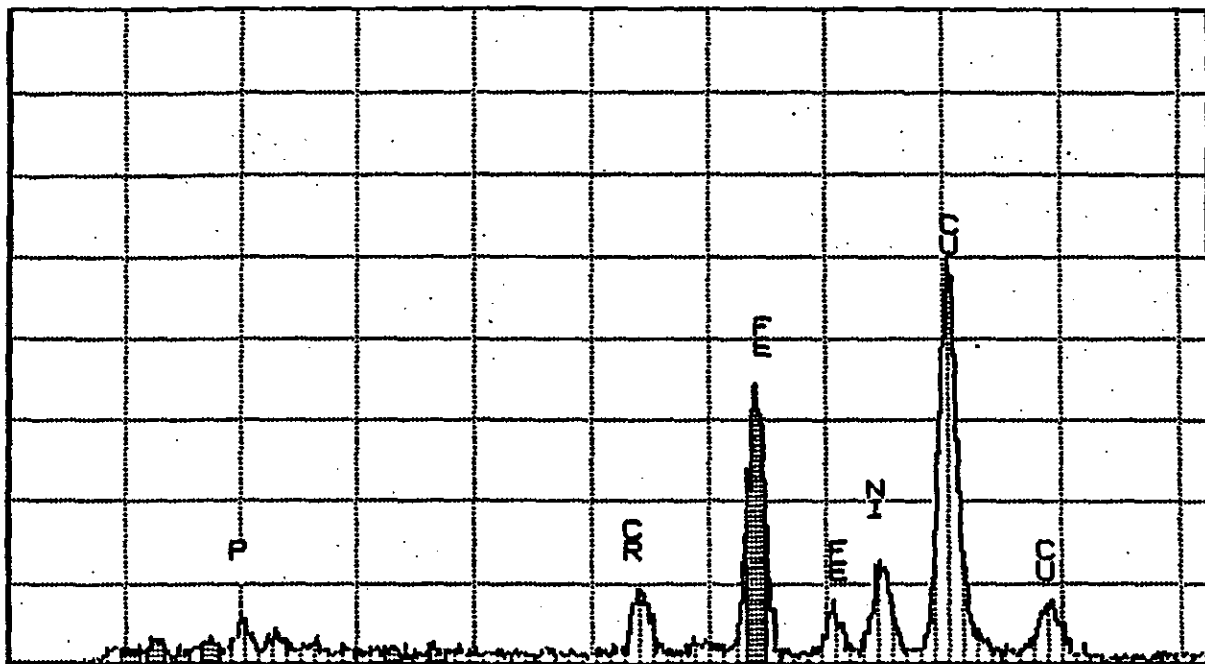
M3825-10, GYPSUM

MATERIALS ANALYTICAL SERVICES

FRI 22-JUN-90 10:18

Cursor: 0.000keV = 0

ROI (SIK $\alpha$ ) 1.660: 1.810=126



0.000

60

M3825-10. STEEL

VFS = 256

10.240

PIS 00061067





MATERIALS ANALYTICAL SERVICES, INC.  
3597 Parkway Lane, Suite 250  
Norcross, GA 30092  
404/448-3200

TEM ANALYSIS: BULK ANALYSIS

PROJECT: PRUDENTIAL: BROOKHOLLOW  
SAMPLE NUMBER: M3825-16  
SAMPLE ID: S-3 PARKING GARAGE 5TH LEVEL

DATE OF ANALYSIS: 6/22/91

ANALYST: W.B. Eichel

---

Asbestos Minerals: CHRYSOTILE (EDS)(DIFF)

Other Components: VERMICULITE (EDS)  
GYPSUM (EDS)(DIFF)  
CALCITE (EDS)(DIFF)

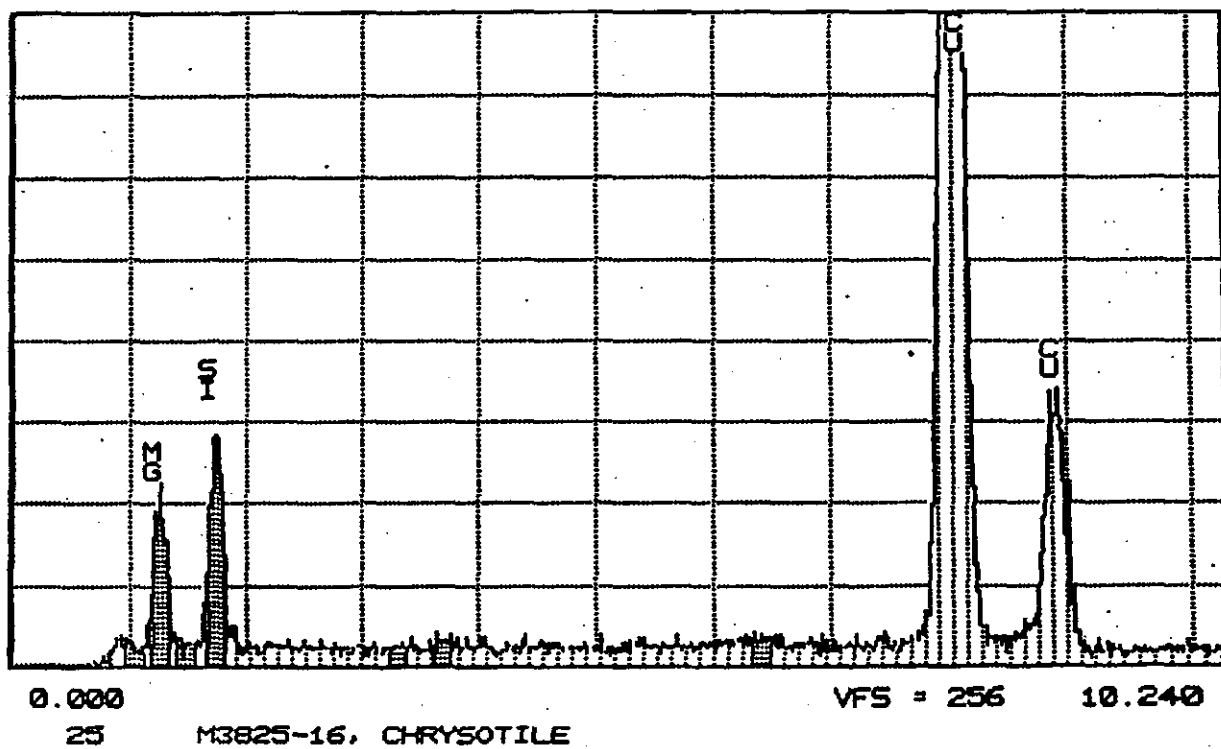
Comments:

MATERIALS ANALYTICAL SERVICES

FRI 22-JUN-90 09:46

Cursor: 0.000keV = 0

ROI (SIK $\alpha$ ) 1.660: 1.810=1022

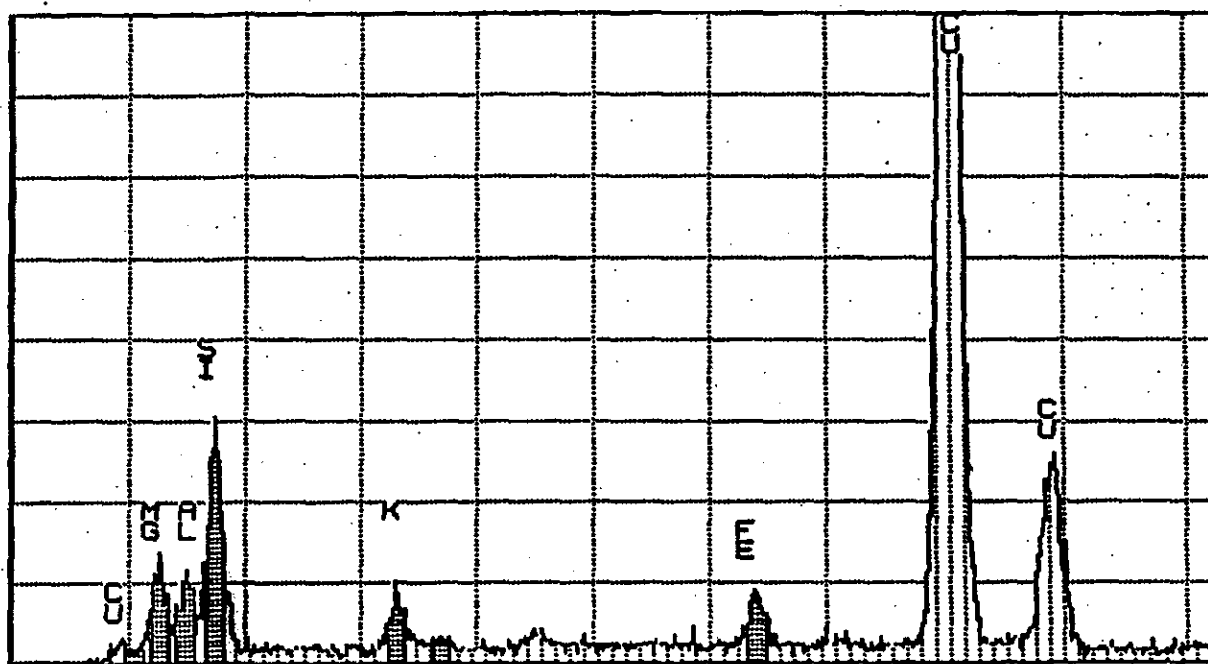


MATERIALS ANALYTICAL SERVICES

FRI 22-JUN-90 09:43

Cursor: 0.000KeV = 0

ROI (SIK $\alpha$ ) 1.650: 1.810=1045



0.000

VFS = 256

10.240

15

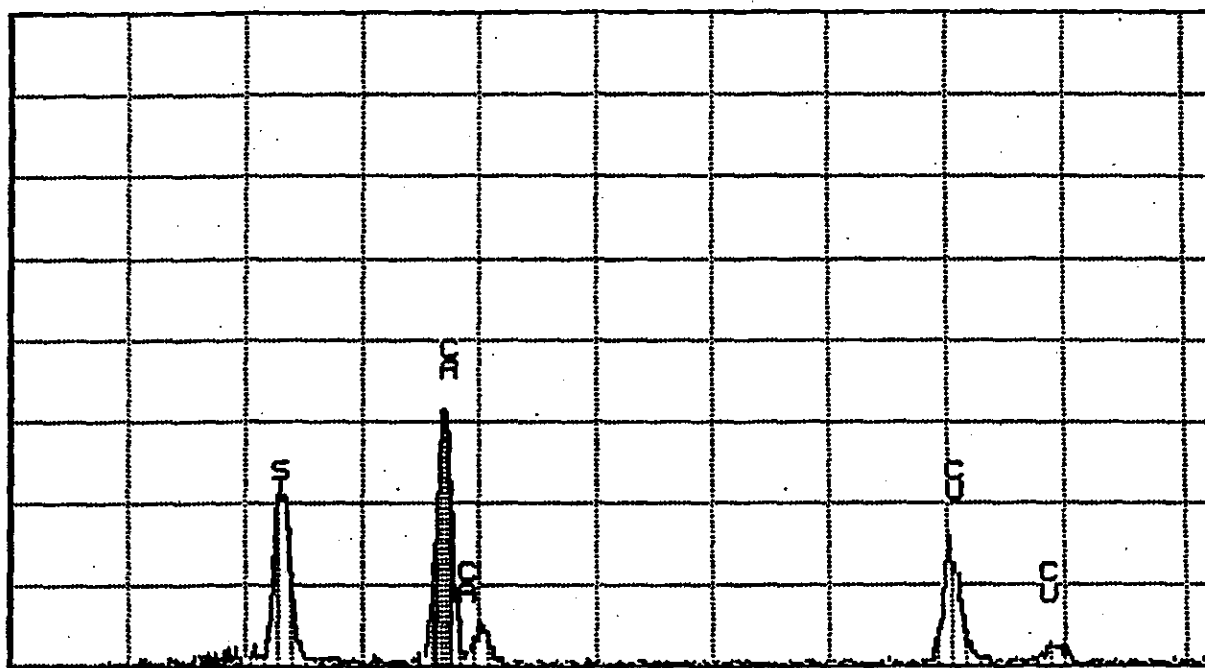
M3825-16, VERMICULITE

MATERIALS ANALYTICAL SERVICES

FRI 22-JUN-90 09:51

Cursor: 0.000keV = 0

ROI (SIK $\alpha$ ) 1.660: 1.810=48



0.000

VFS = 256

10.240

33

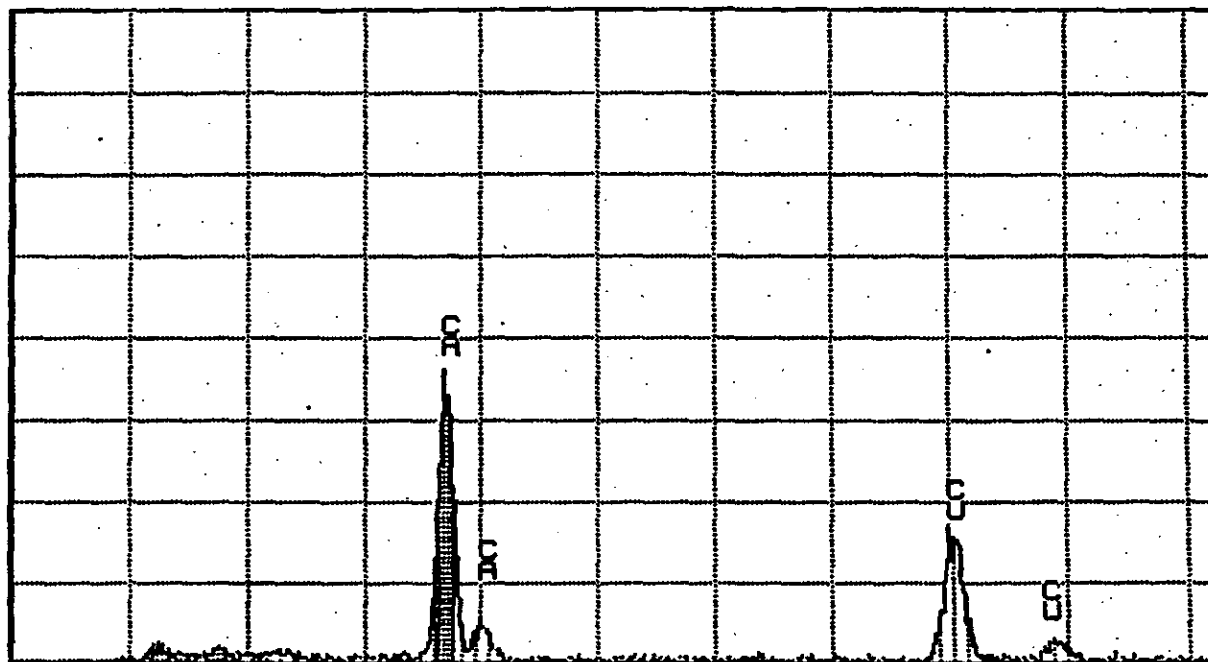
M3825-16, GYPSUM

MATERIALS ANALYTICAL SERVICES

FRI 22-JUN-90 10:06

Cursor: 0.000keV = 0

ROI (SIKα) 1.660: 1.810=69



0.000

26

M3825-16, CALCITE

VFS = 256

10.240

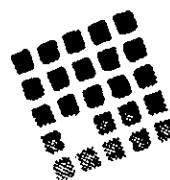
PIS 00061072

## ADDITIONAL BULK ANALYSIS

Sample # M3825-10Date 3/8/90Analyst W.B. Egelund

## ACID DISSOLUTION

(1) Petri dish plus sample:	<u>7.7122</u> g
(2) Petri dish minus sample:	<u>7.3842</u> g
(3) Original sample weight:	<u>0.3280</u> g
(4) Filter weight:	<u>0.0714</u> g
(5) Clean petri dish weight:	<u>7.3905</u> g
(6) Final sample weight plus filter and petri dish:	<u>7.6223</u> g
(7) Final sample wt: ((6) - [(4) + (5)])	<u>0.1604</u> g
(8) Percent residue wt: ((7)/(3) x 100)	<u>48.9</u> %
(9) Amount in solution: (100 - (8))	<u>51.1</u> %



MATERIALS  
ANALYTICAL  
SERVICES

ADDITIONAL BULK ANALYSIS

STARCH VERIFICATION

Sample # 13825-10

Analyst W. B. England

Date 3/28/90

1) Sample Analyzed before after acid dissolutions

Starch observed

no ✓

yes \_\_\_\_\_

Iodine test  
(ceiling tile only)

positive \_\_\_\_\_

negative \_\_\_\_\_

P18 00061074

3597 Parkway Lane • Suite 250  
Norcross, Georgia 30092  
(404) 448-3200

## ADDITIONAL BULK ANALYSIS

Sample # M 3825-16Analyst W. D. EysenhardDate 3/8/90

## ACID DISSOLUTION

(1) Petri dish plus sample:	<u>7.8040</u> g
(2) Petri dish minus sample:	<u>7.3497</u> g
(3) Original sample weight:	<u>0.4543</u> g
(4) Filter weight:	<u>0.0719</u> g
(5) Clean petri dish weight:	<u>7.3164</u> g
(6) Final sample weight plus filter and petri dish:	<u>7.5783</u> g
(7) Final sample wt: ((6) - [(4) + (5)])	<u>0.1880</u> g
(8) Percent residue wt: ((7)/(3) x 100)	<u>41.4</u> %
(9) Amount in solution: (100 - (8))	<u>58.6</u> %





MATERIALS  
ANALYTICAL  
SERVICES

ADDITIONAL BULK ANALYSIS

STARCH VERIFICATION

Sample # M3825-16

Analyst W. B. Eichel

Date

3/28/90

1) Sample Analyzed before after acid dissolutions

Starch observed

no ☒

yes ☐

Iodine test  
(celling tile only)

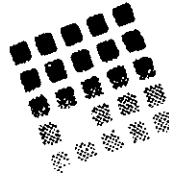
positive ☐

negative ☐

PIS 00061076

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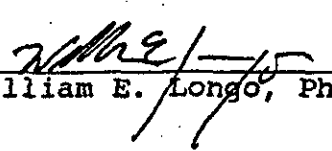
MATERIALS  
ANALYTICAL  
SERVICES

March 27, 1991

RE: Brookhollow I  
Houston, Texas

The constituent analysis of additional fireproofing samples for the above-referenced project supplements my July 11, 1990 opinion and confirms that the samples analyzed are Mono-Kote 3, which was manufactured by W. R. Grace.

Worksheets reflecting the analysis are attached.

  
\_\_\_\_\_  
William E. Longo, Ph.D.

PIS 00111314

3597 Parkway Lane • Suite 250  
Norcross, Georgia 30092  
(404) 448-3200 FAX (404) 368-8256

BUILDING: Brookhollow I  
Houston, Texas

The following bulk samples from the above-referenced building were analyzed and were used to supplement the opinion regarding the manufacturer and product.

<u>Bulk Sample</u>	<u>Sample Location</u>	<u>Collected By</u>
1-4	Parking Garage First Level	BCM

## MATERIALS ANALYTICAL SERVICES, INC.

## BULK ASBESTOS SHEET

Project # - Spl #: 173825-8Date: 3/26/91Project Name: PROBENTIAL; BROOKHOLLOW 120.47Analyst: L.B. EgleSample Identification: #1-4 PARKING GARAGE 1<sup>ST</sup> LEVELGross Visual Description: LIGHT BEIGE, GOLD FLAKES AND BOIKI AS WELL AS FIBERS THROUGHOUT A FINE MATRIX.

## Optical Data for Asbestos Identification

Morphology . . . . .	<u>WAVEY</u>	. . . . .	_____
Pleochroism . . . . .	<u>NONE</u>	. . . . .	_____
Refractive Index . . . . .	<u>(210) 1.57/1.52</u>	. . . . .	_____
Sign of Elongation . . . . .	<u>+</u>	. . . . .	_____
Extinction . . . . .	<u>parallel</u>	. . . . .	_____
Birefringence . . . . .	<u>low</u>	. . . . .	_____
Melt . . . . .	<u>NO</u>	. . . . .	_____
Fiber Name . . . . .	<u>CHRYSTOLE</u>	. . . . .	_____

## ASBESTOS MINERALS:

Est. Vol. %

Chrysotile . . . . . 8

Amosite . . . . . \_\_\_\_\_

Crocidolite . . . . . \_\_\_\_\_

Tremolite/Actinolite . . . . . \_\_\_\_\_

Anthophyllite . . . . . \_\_\_\_\_

## OTHER FIBROUS COMPONENTS:

Mineral/Rock wool . . . . . \_\_\_\_\_

Fibrous glass . . . . . \_\_\_\_\_

Cellulose . . . . . \_\_\_\_\_

Synthetic . . . . . \_\_\_\_\_

Other . . . . . \_\_\_\_\_

## NON-FIBROUS COMPONENTS:

Perlite . . . . . \_\_\_\_\_

Vermiculite . . . . . 35

Other . . . . . \_\_\_\_\_

Binders . . . . . 57ABUNDANT GYPSUM WITH SCATTERED FINE GRANULAR MINERALSEFFERVESCENCE: WEAK IN ISOLATED AREAS

## COMMENTS:

NO STARIN OBSERVED. CLUMPS OF FIBROUS MINERAL WOOL, CELLULOSE,

AND SYNTHETIC ADHERING TO SAMPLE (SAMPLE IS DIATY)



## Report on Representative Sampling of Asbestos - Containing Fireproofing

This report has been prepared by Richard L. Hatfield relating to The Prudential Insurance Company of America, et. al. vs. United States Gypsum Company, et. al., Civil Action Nos. 87-4227 and 87-4238 (HAA).

At the request of The Prudential Insurance Company, Law personnel made site visits to Prudential buildings which are the subject of this litigation. Among the purposes for these visits were to confirm the presence, location and homogeneity of the asbestos - containing fireproofing materials and to collect representative samples of the asbestos - containing fireproofing materials. Based on these site visits and other material I have reviewed, I am of the opinion that the samples collected are representative of the asbestos - containing fireproofing found in the buildings.

### 1100 Milam Building, Houston, TX

Law conducted a visual survey of the 1100 Milam Building and collected fireproofing samples in 1989. Our observations and sampling indicates only one type of asbestos - containing fireproofing is located in this building. Eleven representative bulk samples of this material were collected throughout the building. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

### 130 John St. Building, New York, NY

Law conducted a visual survey of the 130 Johns St. Building and collected fireproofing samples in 1988. Our observations and sampling indicates only one type of asbestos - containing fireproofing is located in this building. Three additional representative bulk samples of this material were collected to supplement eight other samples collected by McCrone Environmental. The samples were collected throughout the floors. An additional eight representative bulk samples were collected during a 1991 survey. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

### First Florida Tower, Tampa, FL

Law conducted a visual survey of the First Florida Tower and collected fireproofing samples in 1989. Our observations and sampling indicates only one type of asbestos - containing fireproofing is located in this building. Ten representative bulk samples of this material were collected throughout the building. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

### Century Center Buildings 2200 and 2600, Atlanta, GA

Law conducted a visual survey of the Century Center Buildings 2200 and 2600 and collected fireproofing samples in 1989. Our observations and sampling indicates only one type of

asbestos - containing fireproofing is located in these buildings. Fourteen representative bulk samples of this material were collected throughout the 2200 building and five representative bulk samples were collected from the 2600 building. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

Chatham Center/Hyatt in Pittsburgh, PA

Law conducted a visual survey of the Chatham Center/Hyatt and collected fireproofing samples in 1988. Our observations and sampling indicated only one type of asbestos - containing fireproofing located on floors ground through ten. Seven representative bulk samples of this material were collected throughout the floors. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

Northland Towers (East & West), Southfield, MI

Law conducted a visual survey of the Northland Towers (East & West) and collected fireproofing samples in 1988. Our observations and sampling indicates only one type of asbestos - containing fireproofing is located in these buildings. Eleven representative bulk samples of this material were collected from the East Tower and sixteen representative samples from the West Tower. The samples were collected throughout each tower. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

Northwest Financial Building, Bloomington, MN

Law conducted a visual survey of the Northwest Financial Building and collected fireproofing samples in 1988. Our observations and sampling indicates only one type of asbestos - containing fireproofing is located in this building. Four additional, representative bulk samples of this material were collected throughout the floors to supplement other representative samples collected by other consultants. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

Pru Plaza, Buildings A & B, Denver, CO

Law conducted a visual survey of the Pru Plaza, Buildings A & B and collected fireproofing samples in 1988. Our observations and sampling indicates only one type of asbestos - containing fireproofing is located in these buildings. Eight representative bulk samples of this material were collected throughout the A building and four representative bulk samples were collected from the B building. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

Southdale Office Complex, Edina, MI

Law conducted a visual survey of the Southdale Office Complex and collected fireproofing samples in 1989. Our observations and sampling indicates only one type of asbestos - containing fireproofing is located in this building. Fourteen representative bulk



samples of this material were collected throughout the building. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

Embarcadero I and II, San Francisco, CA

Law conducted visual surveys of Embarcadero I and II and collected fireproofing samples in 1989. Our observations and sampling indicates only one type of asbestos - containing fireproofing is located in each of these buildings. Four representative bulk samples of the fireproofing material located in Embarcadero I were collected to supplement seven samples previously obtained by McCrone and 20 representative bulk samples were collected throughout Embarcadero II. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

Renaissance Tower, Dallas, TX

Law conducted a visual survey of the Renaissance Tower and collected fireproofing samples in 1989. Our observations and sampling indicates only one type of asbestos - containing fireproofing is located in this building. Fifteen representative bulk samples of the fireproofing material were collected throughout most of the building. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

5 Penn Center, Philadelphia, PA

Law conducted a visual survey the 5 Penn Center building and collected fireproofing samples in 1988. Our observations and sampling indicates only one type of asbestos - containing fireproofing is located in this building. Fifty-one representative bulk samples of the fireproofing material were collected throughout the building. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

Twin Towers ( Gaslight North and South), Atlanta, GA

Law conducted a visual survey of the Twin Towers ( Gaslight North) and collected fireproofing samples in 1988. Our observations and sampling indicates only one type of asbestos - containing fireproofing is located in this building. Twenty-one representative bulk samples of the fireproofing material were collected throughout the building. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

Law conducted a visual survey of the Twin Towers (South Tower) and collected fireproofing samples in 1989. Our observations and sampling indicates only one type of asbestos - containing fireproofing is located in this building. Forty - one representative bulk samples of this material were collected throughout the floors. These samples as well as other

samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

Prudential Plaza, Newark, NJ

Law conducted a visual survey of the Prudential Plaza office building and Mall and collected two fireproofing samples from the 5th floor of the office building in 1988. Our observations and sampling indicates only one type of asbestos - containing fireproofing is located in the office building and a different type of fireproofing in the Mall. Twelve representative bulk samples of the fireproofing material located in the Mall were collected by K & D asbestos consultants. These samples as well as other samples collected by others were submitted to Materials Analytical Services (MAS) for constituent analysis.

Hunt Valley Marriott, Hunt Valley, MD

During our 1988 site visit one sample representing the chrysotile asbestos - containing fireproofing was collected. Additionally two samples representing the amosite asbestos - containing fireproofing were collected by K & D asbestos consultants and were submitted to Materials Analytical Services (MAS) for constituent analysis.

Short Hills Office, Short Hills NJ

Two representative samples of fireproofing were collected by K & D asbestos consultants from the centrally located air handling rooms of the 2nd and the 4th floors of Short Hills Office, Short Hills NJ. building and were submitted to Materials Analytical Services (MAS) for constituent analysis.

Brookhollow, Houston, TX

At the request of The Prudential Insurance Company, four representative samples of fireproofing were collected by BCM asbestos consultants from the centrally located elevator shafts of the 4th, 5th and 7th floors of Brookhollow, Houston, TX and were submitted to Materials Analytical Services (MAS) for constituent analysis.

Signed

*Richard L. Hatfield*

Richard L. Hatfield  
Corporate Consultant  
August, 1996





**REPORT PREPARED  
BY  
RICHARD L. HATFIELD  
RELATING TO THE  
PRUDENTIAL INSURANCE COMPANY OF AMERICA,  
ET. AL.  
VS.  
UNITED STATES GYPSUM COMPANY, ET. AL.  
JULY, 1996**

## Report of Inspection and Evaluation of Asbestos - Containing Materials

This report has been prepared by Richard L. Hatfield relating to The Prudential Insurance Company of America, et. al. vs. United States Gypsum Company, et. al., Civil Action Nos. 87-4227 and 87-4238 (HAA).

I obtained Bachelor of Science degrees in Experimental Statistics and Geology from North Carolina State University. I am employed as a consultant in my capacity as Assistant Vice President and Senior Corporate Consultant for Law Engineering and Environmental Services, Inc., Atlanta, Ga. I have been employed at Law since December, 1987. Prior to my employment at Law, I served as Director of Services for McCrone Environmental Services, Inc. for five years. I began my career relating to asbestos, serving as a Technical Field Advisor to the US Environmental Protection Agency's Asbestos in Schools Program. I was appointed as an expert advisor to the US Environmental Protection Agency's negotiated rule making committee to promulgate new regulations for asbestos in schools pursuant to AHERA (Asbestos Hazards Emergency Response Act).

During my years dealing with asbestos - related problems, I have been an instructor in over fifty (50) courses and seminars on asbestos in buildings. I have developed protocols for the collection and analysis of asbestos in settled dust of buildings with asbestos - containing building materials, and consulted with the US Environmental Protection Agency (EPA) and the American Society for Testing and Materials (ASTM) in establishing guidelines for these protocols. These protocols have been accepted by both the scientific and the legal community.

As a consultant, I have served hundreds of public and private building owners regarding the proper response they should make regarding the disposition of asbestos in their properties. As part of my consulting services I have acquired extensive experience in the field of identifying products by visual and microscopic examination of the materials and their components and in the field of collection and analysis of the amount and frequency of asbestos release from asbestos - containing building materials.

I have been qualified as an expert in numerous asbestos property damage cases in the fields of asbestos materials characterization which includes asbestos sampling and analysis by various microscopy techniques and asbestos management, including USG v. Admiral Insurance Co. et. al. 1994 WL 605841, Nov. 3 1994 and City of Greenville v. W.R. Grace & Co., 640 F. Supp. 559 (D.S.C. 1986), aff'd City of Greenville v. W.R. Grace & Co., 827 F.2d (4th Cir. 1987). Upon information and belief, the United States Court of Appeals for the Fourth Circuit relied upon my testimony about the asbestos contamination of the Greenville City Hall Building as proof of property

damage. (See attachment for listing of the last five years of deposition and court testimony.)

I have also participated in or reviewed a number of experiments and demonstrations involving asbestos - containing materials (ACM) in which either the asbestos - containing materials or their residue were disturbed during routine building operations and activities which resulted in the release of significant levels of airborne asbestos - containing dust. Measurements were made of either airborne or surface asbestos dust released during these operations. Such tests have demonstrated that significant numbers of asbestos fibers are released when these routine building operations and activities are undertaken. This release of asbestos fibers into the building's environment results in elevated airborne levels for some time and leads to the contamination of building and property surfaces with asbestos dust. For the purposes of this report, the word "contamination" is intended to convey the idea that the surfaces analyzed contain asbestos fibers to a degree far in excess of what would be expected on a surface which was not in proximity to an asbestos - containing material that was releasing asbestos fibers. In my experience in collecting, analyzing and reviewing thousands of dust samples such as the ones collected in this case, a dust sample taken from areas without asbestos - containing materials or some other identified source will reveal little to no contamination. Therefore, dust samples collected in the vicinity of an asbestos - containing material which reveal significant numbers of asbestos fibers demonstrate release from the material present in addition to demonstrating surface contamination.

Air sampling techniques can prove to be quite useful in measuring airborne asbestos concentrations during work practices which may disturb asbestos-containing materials, debris or dust. Ambient air sampling (sampling during times of no disturbance) can be quite misleading and are not good techniques to determine ACM's condition, or to make determinations as to levels of surface contamination. Ambient air sample results should not be used solely to make decisions about corrective actions since they do not provide sufficient information about airborne levels generated during many routine building activities. Defendants' representatives have collected a series of ambient air samples in and around these buildings. Some observations were made by myself and other Law personnel which would indicate that some of the sampling was not properly conducted. These observations included poorly placed sampling pumps, filters not positioned properly and equipment failure.

Asbestos fibers which are released from deteriorating ACM or from the disturbance of ACM will disburse into the ambient air within the buildings, settling on various surfaces in the building, contaminating various surfaces including furnishing, carpeting, draperies, supplies, books and other materials in buildings. The asbestos dust on these surfaces are subject to reentrainment into the air when this dust is disturbed during routine building activities. The reentrained fibers are as much of a concern as newly released asbestos fibers. The asbestos contamination will remain unless special cleaning procedures are employed to eliminate the asbestos - containing dust from non - porous surfaces or the proper removal and disposal of porous

materials, to which asbestos fibers customarily attach themselves. If ACM which is releasing asbestos fibers is left in areas where surfaces have been cleaned, these surfaces in time will become re-contaminated.

The dust sampling technique is accomplished by running a battery operated air sampling pump, equipped with a membrane filter cassette identical to those used in air sampling over a designated area of a surface. A nozzle fashioned from 1/4 inch diameter tubing is attached to the open nipple of the cassette cap (prior to August 1989 open face cassette). By operating the pump at 2 liters / minute the nozzle face velocity should be approximately 100 cm / second. The actual sample collection process involves delineating a surface area of interest. This is accomplished by measuring a selected area of at least 100 square centimeters. The size of the sampled area may also be measured after the collection is complete. Once the pump is activated, the nozzle is passed along the surface in a manner sufficient to vacuum up any settled dust. Light rubbing of the surface may be necessary to dislodge any lightly attached materials, hard rubbing is not necessary. The vacuuming should continue over the entire sample area until the operator is satisfied that all the dust which can be removed is removed. Upon completion, the sampling cassette should be turned upright and with the pump still running, the cap should be loosened and the nozzle removed and placed into the cassette. After replacing the cap, the pump may be turned off and the cap plug replaced to seal the cassette. These samples are documented as to their location, surface and area sampled, along with other pertinent project information. The filters are then transported to a laboratory for analysis.

The materials collected on the filter are then prepared for analysis under the electron microscope. The microscopist identifies and quantifies asbestos fibers in the microscope grid opening and reports the findings in fibers per unit area such as fibers per square centimeter or fibers per square foot using a mathematical calculation.

Having developed the use of dust sampling to make determinations about asbestos fiber release and contamination in the 1980's, I have followed the development of this sampling and analysis technique to present. To my knowledge, there has been only one significant change to the collection process and none to the analysis process. This collection change occurred about mid-1989 following the EPA's dust sampling workshop. Prior to this workshop surface dust samples were collected using an open face cassette. After making some determinations as to the collection efficiency of the open face cassette versus the use of close face cassette equipped with a sampling nozzle, I made the recommendation to the workshop that future sampling be conducted using the nozzle rather than the open face cassette, which was accepted and incorporated in EPA's method. Upon return from the workshop approximately August 1, 1989, I instructed Law personnel to begin using the nozzle for sampling. This is the sampling equipment described in the current ASTM protocol. As part of their work on this case, Compass Environmental collected pair samples using both collection methods. Based on the analytical data generated by this study, one must conclude the open face cassettes were less efficient in the collection of the asbestos dust. On the

average, the open face cassettes collected only 10 percent of the samples now collected using the nozzle equipped cassette.

The following table illustrates the results of the study.

Comparison of Open Face (PR) verses Nozzle Cassettes

	Building	AB (Nozzle) *	PR (Open Face) *	Factor
1	Renaissance Tower	7.7 Billion	1.8 Billion	4.28
2	Pru Plaza (Newark, NJ.)	8.8 Billion	467 Million	18.9
3	Embarcadero 1	770 Million	229 Million	3.36
4	Embarcadero 2	5.5 Billion	625 Million	8.78
5	5 Penn Center	8.5 Billion	525 Million	16.19
* Average per sq. ft. asbestos levels from three samples in each building			Total	51.51
			Average	10.3

As requested, I and other Law personnel have inspected and collected samples of various asbestos - containing materials and dust samples in the buildings which are the subject of this litigation. Law personnel also accompanied defendants' representatives during their inspections. During most of these visits, reports, photographs and, in some cases, video tape documentation were generated. The subject asbestos-containing materials in these buildings are friable fireproofing which is generally sprayed on to steel beams, columns and floor decking.

The inspection process included a physical examination of the materials to determine the presence, location and use of the materials in the buildings and a determination of conditions. The level of contamination was measured in most of the facilities by the collection and analysis of dust samples. The findings of the inspection and sample collection were documented in various forms including reports, notes, logs, 35 mm photographs and video tape.

In some cases demonstrative activities were conducted and video taped to show how certain activities such as opening and closing a ceiling tile or disturbing the asbestos - containing materials release asbestos. These videos clearly demonstrate when asbestos - containing dust and debris or the in place asbestos-containing materials are disturbed, asbestos-containing dust becomes airborne and results in contaminating surfaces below. These videos make use of a lighting technique referred to as the Tyndell light effect to illuminate any airborne particles. This lighting effect is the same as the observation of airborne dust through a stream of sunlight through a window. Dust samples were taken on the top of surfaces above the ceilings prior to the demonstrations and from the plastic covered floor following the demonstrations. These samples demonstrate that asbestos - containing dust was disturbed and that typical maintenance activities result in contaminating surfaces below. For safety, these



demonstrations were conducted in contained areas to prevent the spread of the released asbestos and were thoroughly cleaned following the demonstrations.

The following table illustrates the results of the dust samples collected before and after the video demonstrations.

	Building	Above Ceiling (Before) *	Floor Below (After) *
1	Prudential Plaza (Newark, NJ.)	18.9 Billion	11.5 Billion
2	5 Penn Center	6.7 Billion	8.8 Billion
3	Embarcadero Center 1	37.8 Billion	14.8 Billion

\* Sample results listed above are asbestos structures per sq. ft.

In addition to the general information above, I will also testify about the collection, analysis and interpretation of the dust samples collected at the Prudential buildings by both Compass Environmental and Law Companies.

The general findings are listed below.

1. The overall asbestos control programs are in place and functioning.
2. Since their discovery, a significant amount of the ACM has been removed. Some areas of the ACM have been encapsulated or enclosed, while other areas of the remaining materials have been repaired or patched under the O&M programs and will require continuous monitoring until such time as they are removed.
3. In general, friable ACMs can be classified in the following conditions. Materials which appear in good condition display very little damage (less than 1%), no asbestos - containing debris is present and conditions exist where only slight or no contamination is or should be present. Materials described as in fair condition indicates some damage was observed (1 - 10%), some asbestos - containing debris is present and levels ranging from moderate to extreme contamination would likely be or is present. Poor condition materials have significant damage (greater than 10% overall), significant amounts of asbestos - containing debris present and heavy to extreme levels of contamination very likely to be or are present. These condition categories are consistent with as AHERA's (Asbestos Hazards Emergency Response Act) damaged categories of no damage, damaged, and significantly damaged ACM. Additionally, AHERA use the potential for damage to add two additional categories, potential for damage and potential for significant damage. Generally, current conditions are the best indication of a material's potential for damage, unless there are

indications of future changes in the material's environment which would either increase or decrease the material's potential for damage.

4. The remaining materials located in the Prudential buildings are generally in a fair condition with some areas in poor condition. Additional areas of materials were observed in poor condition prior their to removal.
5. The conditions of the fireproofing in the Prudential buildings were generally a result of water damage, air erosion, vibration, building movement, physical contact causing abrasions, scratches, and gouges, delamination of materials due to the loss of either cohesion or adhesion, and cracking.
6. Nearly all of the dust samples collected and analyzed established some level of contamination; many samples demonstrated levels of contamination in excess of one (1) billion asbestos structures per square foot (extremely contaminated). Generally, as one might expect, the dust samples taken in closer proximity of the ACM resulted in the higher levels of contamination.
7. All of the building personnel encountered during the inspections were aware of the presence of the asbestos materials in their buildings.

#### Building Specific Information and Opinions

1. Prudential Plaza Denver, Co. - The fireproofing materials where located in the two low rise buildings A and B. These buildings were inspected by myself in 1988 and the fireproofing materials were observed in fair condition: During this visit ten dust samples were collected in various locations in each building. The analytical results of these dust samples demonstrated fiber release, and contamination. The results ranged from BDL (Below Detectable Limit) to 1.1 billion asbestos structures per square foot. Note that these dust samples were collected using the open face method and should be considered conservative. It is my opinion that the subject fireproofing in this building released asbestos fibers and debris and caused contamination in this building.
2. Century Center Atlanta, Ga. - In 1988 Law personnel collected ten dust samples throughout the 2200 building. The analytical results of these dust samples ranged from 1.1 million to 11.7 billion asbestos structures per square foot. Note that these dust samples were collected using the open face method and should be considered conservative. This material was in fair to poor condition. Eight dust samples were collected in the 2600 building and resulted in 303 thousand to 19.1 billion asbestos structures per square foot. Note these dust samples were collected using the open face method and should be considered conservative. This material was also in fair to poor condition. It is my opinion that the subject

fireproofing in these buildings released asbestos fibers and debris and caused contamination in these buildings.

3. Embarcadero One San Francisco, Ca. - In 1988 fifteen dust samples were collected during an inspection. The results of these early dust samples ranged from BDL to 7.9 billion asbestos structures per square foot. Note these dust samples were collected using the open face method and should be considered conservative. In 1995, I made an additional inspection of the materials remaining in the building and found them in fair to poor condition. During this inspection I collected four additional dust samples, which, when analyzed, resulted in 7.7 billion to 11.3 billion asbestos structures per square foot. Additionally, 3 dust samples collected by Compass Environmental also confirmed the presence of asbestos contamination at levels between 501 million to 1.2 billion asbestos structures per square foot. It is my opinion that the subject fireproofing in this building released asbestos fibers and debris and caused contamination in this building.
4. Embarcadero Two San Francisco, Ca. - In 1988, nine dust samples were collected throughout the first eleven floors where the asbestos - containing fireproofing is located. The results of these samples showed a contamination level of BDL to 89 million asbestos structures per square foot. Note these dust samples were collected by the open face method and should be considered conservative. During a 1994 inspection by Law personnel, seven additional dust samples were collected, of which three were analyzed. The results indicated contamination levels between 1.8 billion and 5.1 billion asbestos structures per square foot. I also inspected this building during my 1995 visit and collected three additional dust samples. These samples resulted in contamination levels between 2.4 billion to 25.4 billion asbestos structures per square foot. Additionally, three dust samples collected by Compass Environmental also confirmed the presence of asbestos contamination at levels between 567 million to 12.8 billion asbestos structures per square foot. The fireproofing materials in this building should be considered in fair to poor condition. It is my opinion that the subject fireproofing in this building released asbestos fibers and debris and caused contamination in this building.
5. First Florida Tower Tampa, Fla. - During a 1988 inspection by Law personnel the in place asbestos - containing fireproofing appeared in good condition but fine debris was observed. Eleven surface dust samples were collected from various locations in the building. These samples, when analyzed, demonstrated contamination levels from BDL to 729 millions asbestos structures per square foot. Note these dust samples were collected using the open face method and should be considered conservative. In 1995, I inspected the remaining asbestos- containing fireproofing and collected four additional dust samples. These dust samples showed a contamination level of between 1.1 billion and 36.8 billion asbestos structures per square foot. Most of the remaining asbestos - containing fireproofing was observed in rather poor condition. It is my opinion

that the subject fireproofing in this building released asbestos fibers and debris and caused contamination in this building.

6. Chatham Center/Hyatt Pittsburgh, Pa. - Reports from consultants indicated that the fireproofing located in the first ten floors showed signs of damage. These conditions were confirmed by a 1988 inspection by Law personnel. During this inspection nine dust samples were collected. The results of these dust samples demonstrated levels of contamination between 67.4 thousand and 75 million asbestos structures per square foot. Note these dust samples were collected using the open face method and should be considered conservative. It is my opinion that the subject fireproofing in this building released asbestos fibers and debris and caused contamination in this building.
7. 5 Penn Center Philadelphia, Pa. - Reports by asbestos consultants indicated that the asbestos - containing fireproofing was damaged and deteriorating and became airborne when disturbed. Inspection of the fireproofing by Law personnel confirmed these conditions and five dust samples showed contamination levels between 149 thousand and 85 million asbestos structures per square foot. Note these dust samples were collected using the open face method and should be considered conservative. An additional inspection by myself of the remaining material on the 35th floor revealed asbestos - containing fireproofing in very poor condition with much delamination of the fireproofing and debris observed. Five additional dust samples obtained during this inspection revealed contamination levels between 2.7 billion to 9.1 billion asbestos structures per square foot. Additionally, 3 dust samples collected by Compass Environmental also confirmed the presence of asbestos contamination at levels between 4.1 billion to 13.1 billion asbestos structures per square foot. It is my opinion that the subject fireproofing in this building released asbestos fibers and debris and caused contamination in this building.
8. 130 Johns St. New York, NY. - The asbestos - containing fireproofing in this building is applied primarily to the structural columns of the building. However, the fireproofing is accessible above the drop ceiling at the top of the columns, at certain exterior columns and in mechanical spaces. During a 1988 inspection by Law personnel, areas of fireproofing were observed damaged fireproofing and resulting debris was observed. Eleven surface dust samples and a HVAC pre-filter sample were collected during this visit. The resulting analyses indicated contamination levels ranging from BDL to 26.3 million asbestos structures per square foot. Note these dust samples were collected using the open face method and should be considered conservative. In 1995 I inspected this facility and observed material in fair to poor condition. I collected an additional four dust samples. These samples indicated contamination levels between 1.0 billion and 24.3 billion asbestos structures per square foot. It is my opinion that the subject fireproofing in this building released asbestos fibers and debris and caused contamination in this building.

9. Hunt Valley Marriott, Hunt Valley, Md. - During inspections by asbestos consultants, the fireproofing materials were observed in damaged and deteriorating conditions. Law personnel inspected the facility in 1988 and confirmed similar observations. During Law's inspection, six surface dust samples and a HVAC pre-filter sample were collected. The ensuing analysis indicated contamination levels between BDL and 2.1 billion asbestos structures per square foot. Note these dust samples were collected using the open face method and should be considered conservative. It is my opinion that the subject fireproofing in this building released asbestos fibers and debris and caused contamination in this building.
10. 1100 Milam, Houston, TX. - Law personnel inspected this facility in 1988 and observed some of the fireproofing in damaged condition. During this inspection fifteen dust samples were collected throughout the building. The results of these dust samples demonstrated contamination levels between 1.7 million and 5.7 billion asbestos structures per square foot. Note these dust samples were collected using the open face method and should be considered conservative. It is my opinion that the subject fireproofing in this building released asbestos fibers and debris and caused contamination in this building.
11. Northland Towers, Southfield, Mi. - Law personnel inspected the tower buildings in 1988. During the inspection the asbestos - containing fireproofing was observed in fair condition with some areas in poor condition. Six dust samples were collected from the East and West towers. These dust samples had asbestos concentrations between 78 thousand and 40 million asbestos structures per square foot. Note these dust samples were collected using the open face method and should be considered conservative. These conditions were confirmed visually by my inspection in 1996 and by three additional dust samples collected in the West Tower and three additional dust samples collected in the East Tower by Compass Environmental. The results of these samples ranged from 2 billion to 5.9 billion asbestos structures per square foot in the West Tower and from 186.5 million to 3.1 billion asbestos structures per square foot in the East Tower. It is my opinion that the subject fireproofing in these buildings released asbestos fibers and debris and caused contamination in these buildings.
12. Northwest Financial Building, Bloomington, MN - During a 1988 inspection by Law personnel the in place asbestos - containing fireproofing appeared in good condition but fine debris and dust were observed. Fifteen dust samples were collected during this inspection. The results of the dust samples indicated contamination levels which ranged from BDL to 2.6 billion asbestos structures per square foot. Note these dust samples were collected using the open face method and should be considered conservative. It is my opinion that the subject fireproofing in this building released asbestos fibers and debris and caused contamination in this building.

13. Prudential Plaza, Newark, NJ - Law personnel inspected the fireproofing in the mall area and observed delamination and debris present on tops of ceiling tiles. The fireproofing in the office building was observed and dust samples were collected. The results were between BDL and 437 thousand asbestos structures per square foot. In 1995 I inspected the mall areas and the 5th floor of the office complex. I observed the fireproofing in the mall areas to be in fair to poor condition with much debris in many areas. I also inspected the asbestos - containing fireproofing on the 5th floor of the office complex. This material was in poor condition. During my inspection seven dust samples were collected from both areas. The results of these dust samples indicated contamination levels between 1.1 billion to 26.6 billion asbestos structures per square foot. Additionally, 3 dust samples collected by Compass Environmental also confirmed the presence of asbestos contamination at levels between 2.2 billion to 21.7 billion asbestos structures per square foot. It is my opinion that the subject fireproofing in this building released asbestos fibers and debris and caused contamination in this building.
14. Renaissance Tower, Dallas TX - Law personnel inspected the building in January of 1989. Observations of fireproofing debris and dust were made. Nine surface dust samples were collected and analyzed. The results indicated contamination levels between BDL and 10.9 billion asbestos structures per square foot. Note these dust samples were collected using the open face method and should be considered conservative. An additional inspection was made by Law personnel in 1996 and confirmed the condition of the remaining fireproofing in fair condition. Additionally, three dust samples collected by Compass Environmental confirmed the presence of asbestos contamination at levels between 2.2 billion to 17.0 billion asbestos structures per square foot. It is my opinion that the subject fireproofing in this building released asbestos fibers and debris and caused contamination in this building.
15. Southdale Office Complex, Edina, MN - In February of 1989 Law personnel inspected the complex and observed fireproofing debris and dust. During the inspection seven dust samples were collected. the analysis of these dust samples indicated contamination levels between BDL and 13.9 billion asbestos structures per square foot. Note these dust samples were collected using the open face method and should be considered conservative. Some air samples were taken during an operations and maintenance procedure which demonstrated elevated airborne concentrations. It is my opinion that the subject fireproofing in this building released asbestos fibers and debris and caused contamination in this building.
16. Twin Towers, Atlanta, GA - Inspections by Law personnel in 1986 and in 1989 observed fireproofing materials in poor condition, with much dust and debris on surfaces below. This condition was confirmed by my inspection in 1995 of the remaining fireproofing on the 21st floor. Four dust samples collected on this floor shows contamination levels between 9.5 billion to 28.3 billion asbestos

structures per square foot. It is my opinion that the subject fireproofing in these buildings released asbestos fibers and debris and caused contamination in these buildings.

17. Brookhollow, Dallas TX - The asbestos - containing fireproofing was removed in 1986 and 1987 prior to occupancy by a new tenant.
18. Short Hills Office Complex, Short Hills, NJ - The asbestos - containing fireproofing was removed in 1984 prior to demolition of the building.

While the mere presence of asbestos - containing materials in a building does not necessarily mean asbestos fibers are being released or that there is an immediate health hazard present, its presence does present a continuing potential for the release of asbestos fibers into the building's environment and a potential for a health hazard. When asbestos materials are present and these materials have and are being disturbed or are deteriorating, asbestos fibers are being released into the air and on to surfaces below. This dust can, in turn being reentrained by the building maintenance staff, outside service personnel and some of the general building occupants. The U.S. EPA believes, as I do, that an increased exposure to asbestos results in an increase in occurrence of asbestos - related diseases. It was obvious from the inspections that the asbestos - containing materials in these buildings have and are continuing to release asbestos due to their presence, condition, activities and the building dynamics, despite reasonably good asbestos control programs. The asbestos - related problems and the asbestos contamination will continue until such time as the accessible, friable asbestos materials are removed.

Generally there are several ways to deal with in place ACMs. These include placing the materials under an Operations and Maintenance Program (O&M). This program is designed to control and minimize disturbance of the ACMs. While all ACM discovered in a building should be placed in an O&M program, only materials in good condition should remain in the program for an extended period of time. Sometimes an ACM is suitable for encapsulation or enclosure. These control methods are coating the ACM with a paint - like material or enclosing the ACM behind an air tight barrier. Both of these control methods should also be considered temporary and the treated ACM must still remain in the O&M program and under the watchful eye of the building's asbestos coordinator. The permanent solution to asbestos related - problems, is to remove the ACM and any contaminated materials which can not reasonably be cleaned, and replace them with new suitable non-asbestos containing materials.

The observations of the use, locations and conditions of the asbestos - containing fireproofing materials made during site visits of Prudential's buildings, the observed dust and debris on tops of ceiling systems and light fixtures coupled with the results of dust sampling conducted in various Prudential's buildings demonstrated building contamination and potential for exposure to airborne asbestos fibers. Additionally, given the location and conditions of the asbestos - containing fireproofing

materials, I would expect conditions and the problems to worsen in the future if not abated. Therefore the appropriate remedial action was to place the asbestos-containing fireproofing materials in an O&M program and schedule their removal and replacement. In my opinion, the corrective actions, in the above listed Prudential buildings were reasonable, appropriate and consistent with this approach.

This report summarizes opinions and testimony which I intend to provide in this case. These opinions are based on my work in these buildings and other buildings around the country, training, experience, studies and research of myself as well as studies and research of others scientists, asbestos professionals and governmental agencies. Attached to this report are my Curriculum Vitae, a list of testimony, a list of documents of which I may rely or use as exhibits, and a list of compensation rates.

Signed

A handwritten signature in cursive script, reading "Richard L. Hatfield". The signature is written in dark ink and is positioned above the printed name.

Richard L. Hatfield

July, 1996



**RICHARD L. HATFIELD**  
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"Re-entrainment Of Asbestos From Dust In A Building With Acoustical Plaster"  
"Asbestos Exposure During and Following Cable Installation in the Vicinity of Fireproofing"

**CAREER SUMMARY**

Mr. Hatfield joined Law Engineering in 1978 and was assigned to the U.S. EPA's "Asbestos in Schools" program in 1979. With the completion of that program and the initial attention of building managers towards the asbestos problems, Mr. Hatfield continued to assist Law by consulting with clients and developing methods to solve asbestos problems.

In 1982, Mr. Hatfield was recruited by a prominent laboratory, McCrone Environmental, to develop and manage their Atlanta based company. Their goal was to provide quality field and laboratory services for the asbestos abatement industry. These services included building surveys, air and project monitoring, consulting, expert testimony, and extensive, analytical and microscopy services. During this time, the company, McCrone

Environmental Services was recognized as a leader in the specialized fields of light and electron microscopy.

During 1987, some significant changes in the industry were made, notably the formulation of Law Associates, Inc. and its subsidiary Electron Microscopy Laboratory - Materials Analytical Services, Inc. Later in 1987, Mr. Hatfield returned to the Law Companies Group by joining Law Associates to help develop its consulting services and assist the laboratory in the development of special analytical services.

### **ASBESTOS RELATED EXPERIENCE**

Mr. Hatfield has been actively engaged in asbestos related services since 1979 when he served as a Technical Field Advisor for U.S. EPA's "Asbestos in Schools Program". While serving on this program, Mr. Hatfield assisted in the formulation of New York State, New Jersey and the City of New York asbestos programs. He helped with training state and local governmental personnel, contractors and the general public in regulations, building surveys and in work procedures associated with the discovery, control and removal of asbestos-containing materials.

Upon the completion of EPA's project, Mr. Hatfield returned to Law and began its development of asbestos related services, particularly its analytical services. Mr. Hatfield's knowledge and experience has been sought to further many others education in dealing with asbestos-related problems. It should be noted that Mr. Hatfield's teaching experience began as a prime instructor in some of the earliest and most recognized training programs.

While directing McCrone Environmental, Mr. Hatfield began serving as a expert witness in property damage, "Cost Recovery" litigation. Utilizing the expertise of the microscopy laboratory, Mr. Hatfield developed procedures for the identification of asbestos-containing products and special methods for evaluation asbestos contamination in buildings. In addition to individual property damage cases, Mr. Hatfield testified at the Johns Manville Hearing for Property Damage settlements in Washington, D.C.

Since returning to Law, Mr. Hatfield has been involved with management and training of project engineers, consulting with a broad spectrum of clients and the development of special analytical services for the laboratory, Materials Analytical Services. Working closely with Dr. Longo and the other microscopists, Mr. Hatfield has shared his procedures and experience to further develop analytical testing services for building evaluation and property damage litigation.

Mr. Hatfield's knowledge and experience has been sought to further many others' education in dealing with asbestos-related problems. In addition to lecturing, Mr.